

**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION**

WESTERNGECO L.L.C.,

Plaintiff,

v.

ION GEOPHYSICAL CORPORATION,

et al.,

Defendants.

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CASE NO. 4:09-CV-1827

AMENDED MEMORANDUM AND ORDER

A number of motions for summary judgment are pending before the Court. Broadly, those motions can be divided into two categories: (1) motions addressing patent invalidity; and (2) motions addressing patent infringement. In this Memorandum and Order, the Court considers first the invalidity motions, including Defendants' Motion for Summary Judgment of Patent Invalidity of the Bittleston Patents (Doc. No. 273), and Defendants' Motion for Summary Judgment of Patent Invalidity of the Zajac Patent (Doc. No. 270). The Court also considers, in examining invalidity, the portion of Plaintiff's Motion for Summary Judgment of Willful Infringement of the '520 Patent (Doc. No. 276) in which Plaintiff moves for summary judgment on patent validity. After considering these three motions, all responses thereto, and the applicable law, the Court concludes that each motion must be denied.

The second category of motions at issue, those that address patent infringement, includes Defendants' Motion for Summary Judgment of Non-Infringement of the

Bittleston Patents' Apparatus Claims (Doc. No. 272); Defendants' Motion for Summary Judgment of Non-Infringement of the '038 Patent's Systems Claims (Doc. No. 269); and (3) Plaintiff's Motion for Summary Judgment of Willful Infringement of the '520 Patent. After considering these motions, all responses thereto, and the applicable law, the Court concludes that Defendants' Motion for Summary Judgment of Non-Infringement of the Bittleston Patents' Apparatus Claims must be denied. Plaintiff's Motion for Summary Judgment of Willful Infringement of the '520 Patent must be granted in part and denied in part. Defendants' Motion for Summary Judgment of Non-Infringement of the '038 Patent's Systems Claims also must be granted in part and denied in part.

INVALIDITY MOTIONS

I. BACKGROUND

Plaintiff WesternGeco, L.L.C. ("WesternGeco") brings claims against Defendants under 35 U.S.C. § 271 based on the alleged infringement of a number of claims in the following WesternGeco patents: (1) U.S. Patent No. 6,932,017 (the "017 patent"); (2) U.S. Patent No. 7,080,607 (the "607 patent"); (3) U.S. Patent No. 7,162,967 (the "967 patent"); (4) U.S. Patent No. 7,293,520 (the "520 patent"); and (5) U.S. Patent No. 6,691,038 (the "038 patent" or the "Zajac patent"). Defendants in this case, ION Geophysical Corporation ("ION"), and Fugro-Geoteam, Inc.; Fugro Geoteam AS; Fugro Norway Marine Services AS; Fugro, Inc.; Fugro (USA), Inc.; and Fugro Geoservices, Inc. (collectively, "Fugro" or "the Fugro Defendants"), jointly have filed four motions for summary judgment. Two of these motions address patent invalidity. (Doc. Nos. 270, 273.) The other two address patent infringement. (Doc. Nos. 269, 272.) Plaintiff's pending motion for summary judgment addresses both invalidity and infringement. (Doc.

No. 276.) As the Court has addressed the factual background in this case in considering a number of prior motions, it does not do so again here.

II. LEGAL STANDARDS

A. Summary Judgment

Summary judgment is appropriate where the pleadings and evidence show that no genuine issue of material fact exists, and that the movant therefore is entitled to judgment as a matter of law. Fed. R. Civ. P. 56. The party moving for summary judgment must demonstrate the absence of any genuine issue of material fact; however, that party need not negate the elements of the nonmovant's case. *Little v. Liquid Air Corp.*, 37 F.3d 1069, 1075 (5th Cir. 1997). If the moving party meets this burden, the nonmoving party then must go beyond the pleadings to identify specific facts showing there is a genuine issue for trial. *Id.* "A fact is 'material' if its resolution in favor of one party might affect the outcome of the lawsuit under governing law." *Sossamon v. Lone Star State of Tex.*, 560 F.3d 316, 326 (5th Cir. 2009) (citation omitted).

Factual controversies should be resolved in favor of the nonmoving party. *Liquid Air Corp.*, 37 F.3d at 1075. However, "summary judgment is appropriate in *any* case where critical evidence is so weak or tenuous on an essential fact that it could not support a judgment in favor of the nonmovant." *Id.* at 1076 (internal quotations omitted). Importantly, "[t]he nonmovant cannot satisfy his summary judgment burden with conclusional allegations, unsubstantiated assertions, or only a scintilla of evidence." *Diaz v. Superior Energy Servs., LLC*, 341 F. App'x 26, 28 (5th Cir. 2009) (citation omitted). A court should not, in the absence of proof, assume that the nonmoving party could or would provide the necessary facts. *Liquid Air Corp.*, 37 F.3d at 1075.

The Federal Circuit has made clear that “summary judgment is as appropriate in a patent case as in any other.” *Barmag Barmer Maschinenfabrik AG v. Murata Machinery, Ltd.*, 731 F.2d 831, 835 (Fed. Cir. 1984). That is, “[w]here no issue of material fact remains and the movant is entitled to judgment as a matter of law,” the court should grant summary judgment in order “to avoid unnecessary expense to the parties and wasteful utilization of the jury process and judicial resources.” *Id.*

B. Patent Invalidity under 35 U.S.C. § 112

An issued patent is presumed valid, 35 U.S.C. § 282, and an accused infringer has the burden of proving invalidity by clear and convincing evidence. *Aero Products Int’l, Inc. v. Intex Recreation Corp.*, 466 F.3d 1000, 1015 (Fed. Cir. 2006) (citation omitted); *Eli Lilly & Co. v. Barr Labs., Inc.*, 251 F.3d 955, 962 (Fed. Cir. 2001). Section 112 of Title 35 of the United States Code governs what must be included in a patent specification. The requirements of Section 112 include the written description requirement, the enablement requirement, the distinctiveness or definiteness requirement, and, for cases filed prior to September 2011—as this one was—the “best mode” requirement.

1. Definiteness

Section 112 ¶ 2 requires a patent to “point[] out and distinctly claim[] the subject matter which the applicant regards as his invention.” 35 U.S.C. § 112 ¶ 2. Claims are considered indefinite when they are “not amenable to construction or are insolubly ambiguous.” *Young v. Lumenis, Inc.*, 492 F.3d 1336, 1346 (Fed. Cir. 2007). The Federal Circuit has explained:

[T]he definiteness of claim terms depends on whether those terms can be given any reasonable meaning. Indefiniteness requires a determination whether those skilled in the art would understand what is claimed. The purpose of the definiteness requirement is to ensure that the claims, as interpreted in view of the written description, adequately perform their function of notifying the public of the scope of the patentee's right to exclude.

Hearing Components, Inc. v. Shure Inc., 600 F.3d 1357, 1366-67 (Fed. Cir. 2010) (citations omitted). This distinctiveness or definiteness requirement is met if “one skilled in the art would understand the bounds of the claim when read in light of the specification.” *Exxon Research & Eng'g Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001) (citing *Miles Labs., Inc. v. Shandon, Inc.*, 997 F.2d 870, 875 (Fed. Cir. 1993)). Indefiniteness is a question of law. *IGT v. Bally Gaming Int'l, Inc.*, 659 F. 3d 1109, 1119 (Fed. Cir. 2011).

Section 112, ¶ 6 provides that “[a]n element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” 35 U.S.C. § 112 ¶ 6. Such a “means-plus-function” claim format allows a patentee to “describe an element of his invention by the result accomplished or the function served, rather than describing the item or element to be used.” *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 27 (1997). If a claim element that recites a function uses the word “means,” it creates a presumption that the element is drafted in means-plus-function format. *Id.*; *TriMed, Inc. v. Stryker Corp.*, 514 F.3d 1256, 1259 (Fed. Cir. 2008). The means-plus-function presumption can be rebutted if the claim

itself recites a structure to accomplish the functions identified in the claim. *Welker Bearing Co. v. PHD, Inc.*, 550 F.3d 1090, 1096 (Fed. Cir. 2008).

If a patentee uses means-plus-function language, he “must set forth in the specification an adequate disclosure showing what is meant by that language. If an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112.” *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1338 (Fed. Cir. 2008) (quoting *In Re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en banc)). Such a failure results in invalidity for indefiniteness. *In re Dossel*, 115 F.3d 942, 946 (Fed. Cir. 1997).

If a court determines that the means-plus-function analysis applies, it must decide what the claimed function is, and then determine whether a structure corresponding to that function is disclosed in the specification. *Welker Bearing*, 550 F.3d at 1097; *Minks v. Polaris Indus., Inc.*, 546 F.3d 1364, 1377 (Fed. Cir. 2008). If the patent does not contain an adequate disclosure of the structure that corresponds to the claim elements, the patentee will have “failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112.” *Blackboard, Inc. v. Desire2Learn, Inc.*, 574 F.3d 1371, 1382 (Fed. Cir. 2009). Whether the written description adequately sets forth structure corresponding to the claimed function must be considered from the perspective of a person skilled in the art. *Intel Corp. v. VIA Techs., Inc.*, 319 F.3d 1357, 1365-66 (Fed. Cir. 2003) (citing *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1376 (Fed. Cir. 2001)). However, “the question is not whether one of skill in the art would be capable of implementing a structure to perform the function, but whether that person

would understand the written description itself to disclose such a structure.” *Brown v. Baylor Health Care Sys.*, 662 F. Supp. 2d 669, 677 (S.D. Tex. 2009), *aff’d sub nom. Brown v. Baylor Healthcare Sys.*, 381 F. App’x 981 (Fed. Cir. 2010) (citing *Biomedino, LLC v. Waters Techs. Corp.*, 490 F.3d 946, 953 (Fed. Cir. 2007)).

2. Written description

The specification of a patent “shall contain a written description of the invention, and of the manner and process of making and using it.” 35 U.S.C. § 112 ¶ 1. The purpose of the “written description” requirement “is to ensure that the scope of the right to exclude, as set forth in the claims, does not overreach the scope of the inventor’s contribution to the field of art as described in the patent specification.” *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1353-54 (Fed. Cir. 2010) (citing *University of Rochester v. G.D. Searle & Co., Inc.*, 358 F.3d 916, 920 (Fed. Cir. 2004)). “The test for sufficiency of a written description is ‘whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.’” *Bard Peripheral Vascular, Inc. v. W.L. Gore & Assocs., Inc.*, 670 F.3d 1171, 1188 (Fed. Cir. 2012) (quoting *Ariad*, 598 F.3d at 1351). This test “requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art. Based on that inquiry, the specification must describe an invention understandable to that skilled artisan and show that the inventor actually invented the invention claimed.” *Ariad*, 598 F.3d at 1351.

“What is required to meet the written description requirement ‘varies with the nature and scope of the invention at issue, and with the scientific and technologic knowledge already in existence.’” *Id.* at 1363 (quoting *Capon v. Eshhar*, 418 F.3d 1349,

1357 (Fed. Cir. 2005)). A means-plus-function claim does not meet the written description requirement unless there is a known or disclosed correlation between the function and the corresponding structure. *Boston Sci. Corp. v. Johnson & Johnson*, 647 F.3d 1353, 1366 (Fed. Cir. 2011). Compliance with the written description requirement is a question of fact. *Hynix Semiconductor Inc. v. Rambus Inc.*, 645 F.3d 1336, 1351-52 (Fed. Cir. 2011).

3. Enablement

In addition to requiring a written description of the invention, Section 112 requires that the written description be “in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same.” 35 U.S.C. § 112 ¶ 1. The test for enablement is whether a person “skilled in the art, after reading the specification, could practice the claimed invention without undue experimentation.” *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 999 (Fed. Cir. 2008) (citation omitted).

In determining whether a disclosure requires undue experimentation, courts may consider the following factors: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. *ALZA Corp. v. Andrx Pharm., LLC*, 603 F.3d 935, 940 (Fed. Cir. 2010) (quoting *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988)).

To satisfy the enablement requirement, the full scope of the claimed invention must be enabled, *Sitrick*, 516 F.3d at 999, but unclaimed elements need not be enabled,

DeGeorge v. Bernier, 768 F.2d 1318, 1324 (Fed. Cir. 1985). An inventor therefore need not enable the commercial embodiment of his invention in cases where the commercial embodiment contains unclaimed elements. *CFMT, Inc. v. Yieldup Inter. Corp.*, 349 F.3d 1333, 1338 (Fed. Cir. 2003). As the Federal Circuit has recognized:

Improvement and selection inventions are ubiquitous in patent law; such developments do not alone cast doubt on enablement of the original invention. In general, few patented inventions are an immediate commercial success. Rather, most inventions require further development to achieve commercial success. Thus, additional inventive work does not alone show nonenablement.

Id. at 1340 (internal citations omitted).

The requirements of written description and enablement “usually rise and fall together. That is, a recitation of how to make and use the invention across the full breadth of the claim is ordinarily sufficient to demonstrate that the inventor possesses the full scope of the invention, and vice versa.” *Am. Med. Sys., Inc. v. Laser Peripherals, LLC*, 712 F. Supp. 2d 885, 912-13 (D. Minn. 2010) (quoting *LizardTech, Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005)) (internal quotation marks omitted). Enablement is a question of law involving underlying factual inquiries. *Id.* (citing *Falko-Gunter Falkner v. Inglis*, 448 F.3d 1357, 1363 (Fed. Cir. 2006)).

4. Best mode

Section 112 also requires that a patent specification “set forth the best mode contemplated by the inventor of carrying out his invention.” 35 U.S.C. § 112 ¶ 1.¹ The

¹ “The version of the Patent Act currently in effect provides that, although an applicant must disclose the best mode to register a patent, a party to a lawsuit may not rely on an alleged best mode disclosure violation to cancel, invalidate, or hold a patent otherwise unenforceable.” *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1084 (Fed. Cir. 2012). That provision applies only to lawsuits filed after the effective date of the Leahy–Smith America Invents Act, Pub. L. No. 112–29, 125

best mode must be disclosed for the invention defined in each claim of the patent. *Pfizer, Inc. v. Teva Pharms. USA, Inc.*, 518 F.3d 1353, 1365 (Fed. Cir. 2008). The best mode analysis is a question of fact involving an inquiry into whether “the inventor both knew of and concealed a better mode of carrying out the claimed invention than that set forth in the specification.” *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1330 (Fed. Cir. 2002). The Federal Circuit has made clear that invalidity for violation of the best mode requirement does not require intentional concealment of a better mode than was disclosed. *United States Gypsum Co. v. National Gypsum Co.*, 74 F.3d 1209, 1215-16 (Fed. Cir. 1996). A defendant moving for summary judgment based on invalidity must prove both prongs of the best mode analysis—knowledge and failure to disclose the mode—by clear and convincing evidence. *Id.*

III. INVALIDITY OF THE BITTLESTON PATENTS

Defendants move for summary judgment on WesternGeco’s apparatus claims for four patents that name Oyvind Hillesund and Simon Bittleston as their inventors (the “Bittleston patents”). These include the ‘017 patent (Doc. No. 273-3), the ‘607 patent (Doc. No. 273-9), the ‘967 patent (Doc. No. 287-31), and the ‘520 patent (Doc. No. 273-1). Defendants contend that these patents are invalid for their failure to meet the requirements of 35 U.S.C. § 112. As to the ‘520 patent, Plaintiff moves for summary judgment of validity.

A. Timeliness of Defenses

Stat. 284, 328 (2011), signed into law on September 16, 2011. Because this case was filed in 2009, the relevant version of the Patent Act does permit an accused infringer to assert a best mode disclosure violation as a defense. 35 U.S.C. § 282 ¶ 2(3) (2006).

Before responding to the specific arguments raised in Defendants' motion, Plaintiff first contends that Defendants' patent invalidity arguments should be precluded on the basis of untimeliness. Plaintiff essentially argues that, because Defendants pled their Section 112 defenses very generally, those defenses should be stricken, and Defendants should not now be allowed to make specific arguments deriving from those general pleadings. While the Court agrees that these defenses were pled very generally, Plaintiff has not raised the issue of Defendants' pleadings until now. Moreover, the cases cited by Plaintiff fail to support the argument that Defendants' broadly pled defenses should be precluded at the summary judgment phase. The Court declines to exclude these defenses on the basis of untimeliness.

B. Definiteness Requirement

Defendants contend that the following claims in the Bittleston patents are invalid for indefiniteness: (1) claim 16 of the '017 patent; (2) claim 15 of the '607 patent; (3) claim 15 of the '967 patent; and (4) claim 18 of the '520 patent.

1. Claim 16 of the '017 patent

Claim 16 of the '017 patent lists four elements, all of which are drafted in the "means-plus-function" format: (1) "means for obtaining a predicted position of the streamer positioning devices"; (2) "means for obtaining an estimated velocity of the streamer positioning devices"; (3) "means for calculating desired changes in the orientations of the respective wings of at least some of the streamer positioning devices using said predicted position and said estimated velocity"; and (4) "means for actuating the wing motors to produce said desired changes in wing orientation." ('017 patent at claim 16.) As noted above, courts considering means-plus-function expressions first must

decide what the claimed function is, and then must determine whether a structure corresponding to that function is disclosed in the specification. *Welker Bearing*, 550 F.3d at 1097. Whether the written description adequately sets forth structure corresponding to the claimed function is considered from the perspective of a person skilled in the art. *Intel Corp.*, 319 F.3d at 1365-66 (citing *Budde*, 250 F.3d at 1376).

Defendants challenge the first, third, and fourth of claim 16's means-plus-function elements. Specifically, Defendants contend that claim 16 fails to provide structure by (1) failing to disclose structure for the "means for predicting"; (2) failing to disclose structure for "calculating desired changes in the orientations of the respective wings of at least some of the streamer positioning devices using said predicted position and said estimated velocity"; and (3) failing to disclose structure for the "means for actuating."

a. Means for obtaining a predicted position of the streamer positioning devices

In construing the '017 patent, the Court has previously determined that the specification does disclose structure corresponding to this language. The Court reasoned that the global control system runs position predictor software to estimate the actual location of each of the birds and that, therefore, that position predictor software is an indisputably necessary structure to perform the disclosed function. (Doc. No. 120 at 28-29.) On that basis, the Court construed this term as "global control system and predictor software; and equivalents thereof." (*Id.* at 29.)

Defendants argue, somewhat conclusorily, that because this means-plus-function claim is computer-implemented—that is, because it uses a control system and predictor software—it must be linked to a corresponding algorithm in order to meet the

definiteness requirement. (Doc. No. 273 at 2.) The Federal Circuit has held that, in cases “involving a special purpose computer-implemented means-plus-function limitation . . . the structure disclosed in the specification [must] be more than simply a general purpose computer or microprocessor.” *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1312 (Fed. Cir. 2012). In such a situation, the specification must “disclose an algorithm for performing the claimed function.” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1367 (Fed. Cir. 2008); *Aristocrat Techs. Australia Pty Ltd. v. Int’l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008) (“[I]n a means-plus-function claim ‘in which the disclosed structure is a computer, or microprocessor, programmed to carry out an algorithm, the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm.’” (quoting *WMS Gaming, Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999))). If, on the other hand, a function can be performed by “any general purpose computer without special programming,” then “it [is] not necessary to disclose more structure than the general purpose processor that performs those functions.” *In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1316 (Fed. Cir. 2011).

The Federal Circuit has recognized two categories of cases in which defendants may challenge special purpose computer-implemented means-plus-function claims. The first includes cases in which the specification discloses no algorithm at all. The second includes cases in which the specification does disclose an algorithm, but the defendant contends that the disclosure is inadequate. *Noah Sys.*, 675 F.3d at 1313. Defendants appear to contend that the claims at issue disclose no algorithm at all.

Before considering Defendants’ arguments on the merits, the Court acknowledges Plaintiff’s contention that Defendants should be estopped from litigating indefiniteness. When the parties were before this Court on claim construction, ION argued that the only structures disclosed in the ‘017 patent that can perform the function of obtaining a predicted position are the global control system and the position predictor software. (*See* Doc. No. 120 at 29.) The Court agreed, and adopted ION’s proposed construction. (*Id.*) In what seems to be a complete reversal of its earlier position, ION now argues that there are *no* structures disclosed in the ‘017 patent corresponding to this function. Such a reversal, Plaintiff urges, should be subject to judicial estoppel.² However, because the Court recognizes that there might be a difference between acknowledging the disclosure of *some* structure—which ION clearly has done—and acknowledging the existence of a *sufficient algorithm*, the Court proceeds to consider Defendants’ argument on the merits.

The Federal Circuit has explained that a patent’s specification can express an algorithm “in any understandable terms including as a mathematical formula, in prose,³ or as a flow chart, or in any other manner that provides sufficient structure.” *Finisar Corp. v. DirecTV Grp., Inc.*, 523 F.3d 1323, 1340 (Fed. Cir. 2008) (citation omitted). Simply disclosing software, “without providing some detail about the means to accomplish the function[,] is not enough.” *Id.* at 1340–41 (citation omitted). The critical

² *See In Re Coastal Plains, Inc.*, 179 F.3d 197, 205 (5th Cir. 1999) (“Judicial estoppel is a common law doctrine by which a party who has assumed on position in his pleadings may be estopped from assuming an inconsistent position.”) (citation omitted).

³ For example, in *Noah Sys.*, 675 F.3d at 1313, the Federal Circuit determined that a specification clearly disclosed an algorithm in prose. The court explained that “[t]he specification clearly discloses that authorized agents are provided with passcodes and that agents cannot enter, delete, review, adjust or process data inputs within the master ledger unless the passcode is verified.” *Id.* The court found this language sufficient to disclose an algorithm for the passcode function associated with “access means.” *Id.* Thus, an algorithm need not be mathematical, and need not include charts or hyper-technical language.

question in considering whether an algorithm is disclosed is whether the algorithm to be implemented by the programmer could, as described in the specification, be “readily implemented by person of skill in computer programming.” *Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1386 (Fed. Cir. 2011).

While testimony from one skilled in the art may aid the court in interpreting the specification, “the testimony of one of ordinary skill in the art cannot supplant the total absence of structure from the specification.” *Default Proof Credit Card Sys., Inc. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1302 (Fed. Cir. 2005); *Med. Instr. & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1212 (Fed. Cir. 2003) (“The correct inquiry is to look at the *disclosure* of the patent and determine if one of skill in the art would have understood that *disclosure* to encompass software [with sufficient structure to perform the recited function], not simply whether one of skill in the art would have been able to write such a software program.”); *see also Elekta AB*, 344 F.3d at 1214 (“[H]ere there would be no need for a disclosure of the specific program code if software were linked to the converting function and one skilled in the art would know the kind of program to use.”). Thus, if structure is disclosed in the specification, and one skilled in the art would interpret that structure as encompassing software capable of performing the recited function, then the claim is not indefinite.

As the Court is to approach the indefiniteness question from the position of one skilled in the art, it looks to the positions taken by the parties’ experts,⁴ bearing in mind

⁴ Though not the subject of comprehensive briefing before this Court, the parties seem to disagree about what would qualify one as a person skilled in the art. For the purposes of this Memorandum and Order, and because the parties did not adequately brief the issue, the Court assumes that both parties’ experts are persons of ordinary skill in the art.

that the burden is on Defendants to establish indefiniteness by clear and convincing evidence. The Court is persuaded by the fact that both Plaintiff's and Defendants' experts opine that the claim is definite. When asked whether he believed that the Bittleston '636 application discloses and enables "predicting positions of streamer positioning devices," Defendants' expert, Robert Brune, answered "yes." (Brune Dep., Doc. 287-16 at 128:12-15.) Plaintiff's expert, Dr. Michael Triantafyllou, states in his declaration that, as to claim 16 of the '017 patent, "there is corresponding structure disclosed, [and] the specification demonstrates to one of ordinary skill in the art that Dr. Bittleston and Mr. Hillesund were in possession of the invention at the time." (Doc. 287-1 ¶ 17-18.). The only expert evidence contradicting this testimony is that of Defendants' expert, Dr. Charles Garris, who states that "one of ordinary skill in the art at the time of the '017 application would be unable to find a structure or act which would satisfy this requirement." (Garris Expert Report, Doc. No. 288-25 at 58-59.)

Although indefiniteness is a question of law, *IGT*, 659 F. 3d at 1119, it requires a factual determination as to what one skilled in the art would have understood by looking at the patent. The expert evidence addressing what one skilled in the art would have understood by looking at this patent is in conflict. Defendants have failed to prove, by clear and convincing evidence, that such a person would not have understood the structure disclosed in the patent. As such, the determination of the factual question underlying this legal issue must be made by a jury.

b. Means for calculating desired changes in the orientations of the respective wings of at least some of the streamer positioning devices using said predicted position and said estimated velocity

As with the previous claim language, Defendants contend that there is no disclosure of a structure corresponding to this language. The Court construed this limitation and found the corresponding disclosed structures to be a “global control system; local control system and localized displacement/force conversion program using a look-up table or a conversion routine; and equivalents thereof.” (Doc. No. 120 at 32.) The only evidence cited in support of Defendants’ indefiniteness contention is Dr. Bittleston’s testimony that “there are multiple ways” to change the orientations of respective wings, depending on the device and the implementation. (Bittleston Dep., Doc. No. 273-7 at 156:14-22.) It is not clear how this testimony, which is consistent with the teachings of the specification as construed by the Court, could possibly prove indefiniteness by clear and convincing evidence.

Further undermining Defendants’ argument is the testimony of Plaintiff’s expert that “a person of ordinary skill in the art would understand the corresponding structure and would be able to implement this limitation in Claim 16 of the ‘017 patent without undue experimentation.” (Triantafyllou Decl. ¶¶ 19-20.) Defendants again have failed to prove indefiniteness by clear and convincing evidence. The Court concludes that the jury will have to determine, after listening to live witness testimony, whether a person of ordinary skill in the art would have understood this language to disclose a corresponding structure.

c. Means for actuating the wing motors to produce said desired changes in wing orientation

Defendants assert that there is no disclosed structure corresponding to this claim limitation. The Court construed this language to mean “motor driver; and equivalents

thereof” (Doc. No. 120 at 33), a construction on which the parties agreed. Defendants now contend that “[n]o *structure* for accomplishing that *function* is shown.” (Doc. No. 273 at 5.) The Court cannot agree, on the limited and conclusory argument made by Defendants, that *no* structure for actuating wing motors is disclosed. Moreover, although the Court did not find the doctrine of judicial estoppel appropriate above, where the disclosure of an algorithm was at issue, the doctrine is far more persuasive here, where the only question is whether the specification discloses a structure that corresponds to this limitation. ION agreed, at one point in this litigation, that it does.

Finally and persuasively, the Federal Circuit has explained that, “[i]f a claim is amenable to construction . . . the claim is not indefinite.” *Aero Prods.*, 466 F.3d at 1016 (citing *Exxon Res. & Eng’g Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001)). The Court construed this claim as having corresponding structure at the urging of both parties. Defendants have failed to prove the indefiniteness of this limitation, and their motion as to this limitation therefore must be denied.

2. Claim 15 of the ‘607 patent

Claim 15 of the ‘607 patent recites a “prediction unit” as one of its elements. It describes the prediction unit’s function as follows: “predict positions of at least some of the streamer positioning devices.” (‘607 patent at claim 15.) Defendants argue, for essentially the reasons asserted above with regard to claim 16’s “means for obtaining a predicted position,” that claim 15 of the ‘607 patent fails for indefiniteness.

Plaintiff contends that this claim is not a “means-plus-function” limitation, as it does not contain the word “means.” *Better Bags, Inc. v. Cont’l Poly Bags, Inc.*, No. H-10-608, 2011 WL 2014551, at *5 (S.D. Tex. May 23, 2011) (“[S]ince the claim does not

contain the word ‘means,’ there is a strong presumption against the ‘means-plus-function’ construction.” (citing *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1358 (Fed. Cir. 2004))). Defendants respond that, under WesternGeco’s theory, a clever patent drafter could avoid the disclosure requirements of Section 112 ¶ 6 by claiming a “predictor” instead of a “means for predicting.”

Ultimately, even if the Court were to construe this limitation as a means-plus-function limitation, Defendants would need to offer evidence regarding how someone skilled in the art would have interpreted the language. The only such evidence comes from Plaintiff’s expert, Dr. Triantafyllou, who testifies that, “[t]o the extent it is necessary for this term to have a corresponding structure in the patent’s specification, it is my opinion that there is corresponding structure disclosed as noted above with ‘means for obtaining a predicted position of the streamer positioning devices.’” (Triantafyllou Decl. ¶ 23.) Dr. Triantafyllou further opines that “a person of ordinary skill in the art would understand the corresponding structure for this limitation in Claim 15 of the ‘607 Patent.” (*Id.* ¶ 24.) Defendants have presented no evidence on this argument, and therefore fail to meet their burden of proving indefiniteness by clear and convincing evidence.

3. Claim 15 of the ‘967 patent

Defendants assert that claim 15 of the ‘967 patent is invalid for improper functional claiming because it creates confusion as to when it is directly infringed. Claim 15 of the ‘967 patent includes an element reciting “a global control system transmitting location information to at least one local control system.” (‘967 patent at claim 15.) Defendants urge that this claim is invalid because it claims both a system and a method, creating confusion.

Claims directed both to systems and to actions performed by users of the systems are considered indefinite if they create confusion as to when an apparatus claim is directly infringed. *See Katz*, 639 F.3d at 1318; *IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377, 1384 (Fed. Cir. 2005). The claim at issue in *IPXL* reads as follows:

The *system of claim 2* [including an input means] wherein the predicted transaction information comprises both a transaction type and transaction parameters associated with that transaction type, and *the user uses the input means* to either change the predicted transaction information or accept the displayed transaction type and transaction parameters.

IPXL, 430 F.3d at 1384. The Federal Circuit held that, because this claim recites both a system and the method for using that system, it is unclear whether the claim is infringed “when one creates a system that allows the user to change the predicted transaction information or accept the displayed transaction, or whether infringement occurs when the user actually uses the input means to change transaction information or uses the input means to accept a displayed transaction.” *Id.* Notably, a number of district courts addressing mixed subject matter claims have found that the *IPXL* invalidity defense does not apply, concluding that the “suspect claims [at issue in those cases] did not cover both an apparatus and a method, but rather were apparatus claims containing functional limitations.” *See Ricoh Co., Ltd. v. Katun Corp.*, 486 F. Supp. 2d 395, 402 (D.N.J. 2007) (collecting cases).

The claim at issue in *Katz* is similar to the challenged claim in *IPXL*, and recites a system with an “interface means for providing automated voice messages . . . to certain of said individual callers, wherein said certain of said individual callers digitally enter data.” 639 F.3d at 1318. The court in *Katz* explained that, “[l]ike the language used in the claim at issue in *IPXL* (‘wherein . . . the user uses’), the language used in the *Katz* claims

(‘wherein . . . callers digitally enter data’ and ‘wherein . . . callers provide . . . data’) is directed to user actions, not system capabilities.” *Id.*

Although functional language directed to user actions, like the language at issue in *IPXL* and *Katz*, can invalidate a claim, “functional language which merely describes the capability of the claimed invention will not render a claimed invention invalid” under *IPXL*. *Eolas Techs., Inc. v. Adobe Systems, Inc.*, 810 F. Supp. 2d 795, 812 (E.D. Tex. 2011) (citing *Microprocessor Enhancement Corp. v. Texas Instruments, Inc.*, 520 F.3d 1357, 1375 (Fed. Cir. 2008)). Thus, in *Yodlee, Inc. v. CashEdge, Inc.*, No. 05–01550, 2006 WL 3456610, at *4–6 (N.D. Cal. Nov. 29, 2006), the court concluded that the claims at issue were valid because they “describe what the apparatuses do, when used in a certain way. They do not claim *use* of the apparatuses.” Likewise, in *Eolas*, the court held that, notwithstanding the claim’s use of the word “wherein,” the claims at issue described the capabilities of the claimed apparatuses, and thus did not render the claims indefinite. 810 F. Supp. 2d at 813-14. In *Toshiba Corp. v. Juniper Networks, Inc.*, No. 03-1035-SLR, 2006 WL 1788479, at *4 (D. Del. Jun 28, 2006), the court similarly denied a motion for summary judgment of invalidity as to a claim with the phrase “*wherein* the control message processing unit communicates with,” holding that the claim recited only the functional capabilities of the apparatus. Ultimately, it is well-established that a functional limitation—that is, an attempt to define something by what it does rather than by what it is—is a permissible means of articulating a claim limitation. *See, e.g., In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997).

Unlike in *Katz* and *IPXL*, the claims of the ‘967 patent do not create confusion as to when infringement occurs. First, they do not attempt to cover an apparatus and a

method in a single claim. Rather, claim 1 is a method claim, and claim 15 is the corresponding apparatus claim. Claim 1 recites a method comprising “transmitting from a global control system location information to at least one local control system” Claim 15 includes a global control system *capable of* transmitting location information to a local control system, whereas claim 1 recites the method transmission. Moreover, claim 15 does not refer to actions to be taken by the user, as in *IPXL* and *Katz*. Instead, the language “a global control system transmitting location information” recites the capabilities of the apparatus, much like the claims at issue in *Eolas* and *Toshiba*. As such, this claim includes valid functional language which merely describes the capability of the claimed invention.⁵

4. Claim 18 of the ‘520 patent

Claim 18 of the ‘520 patent requires “(a) an array of streamers each having a plurality of streamer positioning devices there along; [and] (b) a control system configured to use a control mode selected from a feather angle mode, a turn control mode, a streamer separation mode, and two or more of these modes.” (‘520 patent at claim 18.) As to claim 18, Defendants move for summary judgment of invalidity based on indefiniteness. In light of the Court’s construction of the ‘520 patent as a control system configured to use one or more of the group of four listed modes (discussed below in addressing the infringement motions), Defendants also raise concerns about invalidity

⁵ Defendants’ argument is weakened by the fact that neither Mr. Brune nor Dr. Garriss contend, in their expert reports, that this claim is indefinite. The only mention of the ‘967 patent in these expert reports is a vague reference, in Mr. Brune’s report, which says only that the patent “does not describe” a local control system in a manner sufficient to allow a person of skill in the art to practice it without undue experimentation. (Brune Expert Report at 21.) The absence of any expert opinions as to the indefiniteness of this patent confirms the Court’s conclusion.

based on prior art. Plaintiff cross-moves for summary judgment on the ‘520 patent’s validity.

a. Indefiniteness

The apparatus portion of claim 18 of the ‘520 patent has two elements: (1) an array of streamers; and (2) a control system “configured to use a control mode” that is selected from a list of “modes,” including “feather angle mode,” “turn control mode,” and “streamer separation mode.” (*Id.*) Defendants contend that the “control system” is a computer-implemented element, and therefore that it requires a corresponding algorithm in the specification to satisfy the definiteness requirement. Plaintiff responds that claim 18 is not a means-plus-function claim, so there is no requirement that a corresponding algorithm be supplied in order to make the claim definite. Plaintiff notes that ION’s claim-construction brief did not classify claim 18 of the ‘520 patent as a functional expression governed by Section 112 ¶ 6; indeed, ION sought construction of this claim language, some of which the Court adopted almost verbatim. (Doc. No. 120.) Plaintiff urges that Defendants should be estopped from now arguing that this language, for which ION sought construction, is indefinite.

Putting aside Plaintiff’s argument as to estoppel, the Court finds that, even if this claim were construed as a means-plus-function claim, Defendants provide insufficient evidence to meet their “clear and convincing” burden. Indeed, one of Defendants’ own experts, Mr. Brune, has testified that claim 18 of the ‘520 patent is clear and not indefinite. (Brune Dep. at 175:10-17.) When asked whether, in his expert opinion, Mr. Brune had any doubt as to what is covered by claim 18 of the ‘520 patent, Mr. Brune answered, “[n]o, it’s – it’s clear to me.” (*Id.* at 175:10-12.) When asked whether, in his

opinion, there is anything indefinite about the scope of claim 18, Mr. Brune responded “[n]ot in my interpretation.” (*Id.* at 175:13-17.) Importantly, “[i]f one skilled in the art would understand the bounds of the claim when read in light of the specification, then the claim satisfies section 112 paragraph 2.” *Exxon Research & Eng’g Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2011). Defendants’ unsupported attorney argument fails to prove indefiniteness by clear and convincing evidence.

As Plaintiff moves for summary judgment of validity, the Court also must consider Plaintiff’s argument that claim 18 of the ‘520 patent is valid under 35 U.S.C. § 112. Plaintiff addresses possible challenges to claim 18 raised by Defendants’ experts, including enablement and indefiniteness. Plaintiff acknowledges that Defendants’ expert, Mr. Brune, has stated that claim 18 fails to enable the disclosed modes (Brune Expert Report, Doc. No. 276-71 at 21–22), but urges that Mr. Brune’s argument is “conclusory.” Plaintiff likewise recognizes the opinion of Defendants’ expert Dr. Edgar, who has asserted that the claim is indefinite. (Doc. No. 276-76, Edgar Expert Report at § V(D).) Plaintiff urges that both of these expert opinions are too conclusory, and therefore cannot raise triable issues of material fact on summary judgment. *Dynacore*, 363 F.3d at 1278. The Court disagrees. Many of the expert opinions in this case, on both sides, have been surprisingly conclusory. However, the Court has denied a number of Defendants’ summary judgment arguments in large part because of the factual dispute over the perspective of one skilled in the art, generated by the fairly conclusory opinions of

Plaintiff's expert. Such a factual dispute is similarly present here; for that reason alone, the Court cannot grant Plaintiff's motion for summary judgment of validity.⁶

b. Prior Art under 35 U.S.C. §§ 102, 103

Defendants argue that claim 18 is invalid because it is anticipated under 35 U.S.C. § 102, and because it is obvious under 35 U.S.C. § 103. (Doc. No. 298 at 28-31.)⁷ As the Court has noted, patents are presumed valid, and an accused infringer must prove invalidity by clear and convincing evidence. *Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238, 2242 (2011). This burden is especially high where the accused infringer asserts prior art considered during prosecution, as the USPTO is entitled to the deference accorded to a government agency performing its specified function. *Hewlett-Packard v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1467 (Fed. Cir. 1990). The Court considers anticipation and obviousness below.

i. Anticipation

"For a prior art reference to anticipate in terms of 35 U.S.C. § 102, every element of the claimed invention must be identically shown in a single reference." *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990). "There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field

⁶ In response to Plaintiff's Motion for Summary Judgment of Willful Infringement (Doc. No. 276), Defendants raise a number of other challenges, under 35 U.S.C. § 112, to claim 18's validity. (Doc. No. 298 at 35-28.) However, as these arguments were not raised in Defendants' own motion as a basis for summary judgment of invalidity, and because the Court denies Plaintiff's motion even without considering them, the Court does not need to resolve these additional, alternative arguments.

⁷ It is unclear whether this argument, raised in Defendants' response to Plaintiff's motion, should be construed as a motion for summary judgment. Defendants do not explicitly refer to it as such; instead, Defendants merely state that, *if* claim 18 of the '520 patent is construed as Plaintiff urges (and as the Court now has construed it, below), then the claim should be invalid over the Workman Reference. Without actually moving for summary judgment on this issue, Defendants merely state a contention. Nonetheless, the Court considers the merits of the contention, in the event that it was intended as a motion for summary judgment.

of the invention.” *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir. 1991). “Anticipation is a question of fact.” *Marrin v. Griffin*, 599 F.3d 1290, 1293 (Fed. Cir. 2010).

Defendants argue that, under the Court’s construction of claim 18 of the ‘520 patent, discussed below, the claim is anticipated by U.S. Patent No. 5,790,472 (the “Workman Reference”). (Doc. No. 298-S.) The Workman Reference was filed on December 20, 1996, and issued on August 4, 1998. (*Id.*) Because it was filed before October 1, 1998, the priority date of the ‘520 patent, the Workman Reference is presumptively prior art under 35 U.S.C. § 102(e).⁸ The reference was cited to the Examiner during prosecution of the ‘520 patent.

Under the Court’s construction of claim 18 of the ‘520 patent, the Workman Reference would have to disclose only one of the modes listed in claim 18. Defendants urge that the Workman Reference discloses a control mode that performs the function of claim 18’s “streamer separation mode.” The Court has construed “streamer separation mode” as “a control mode that attempts to set and maintain the spacing between adjacent streamers.” (Doc. No. 120 at 28.)

The Workman Reference discloses a vessel towing a plurality of streamer cables. (Workman Reference at col. 2:66-3:5.) It states that “[s]reamer positioning devices 14, for example birds and tail buoys, may be attached to the exterior of the streamer cables 13 for adjusting the vertical and lateral positions of the streamer cables 13.” (*Id.* at col. 3:14-18.) The Workman Reference also discloses a “streamer cable controller,” which is

⁸ Plaintiff has not contended that the Workman Reference can be removed as prior art by establishing an earlier invention date for the inventors of the ‘520 patent in suit. The Court therefore assumes that Plaintiff concedes that the Workman Reference is prior art to the ‘520 patent.

part of a “seismic data acquisition system” located on the vessel. (*Id.* at fig. 2, col. 3:30-45.) Defendants emphasize the following language in the Workman Reference in support of their argument that it anticipates the “streamer separation mode”:

The marine seismic data acquisition system 05 also includes a ***streamer control processor 40*** for deciding when the streamer cables 13 should be repositioned and for calculating a position correction to reposition the streamer cables 13. Also in the present embodiment of the invention, threshold parameters are established for determining when the streamer cables should be repositioned. Threshold parameters may include a plurality of values for: ***minimum allowable separations between streamer cables 13 A terminal 32 for entering threshold parameters*** is connected to the streamer control processor 40. Threshold parameters may be entered into the streamer control processor 40 before or contemporaneously with the acquisition of a marine seismic survey.

(*Id.* at col. 3:58-4:8 (emphasis added by Defendants).) Although Defendants do not direct the Court to any expert evidence, the Court notes that Dr. Garris does opine, in his expert report, that the turn control and streamer separation modes of the ‘520 patent are anticipated by the Workman Reference. (Garris Report, Doc. No. 308-108 at 6.)

To the extent that Defendants intend to move for summary judgment based on the Workman Reference, this minimal evidence, not even cited by Defendants in their briefing, is insufficient to resolve the fact question of how one of ordinary skill in the art would view the Workman Reference. Defendants’ position is further weakened by the question, which Defendants fail to address, of whether the Workman Reference’s disclosure is enabling with respect to claim 18. “Whether a prior art reference is enabling is a question of law based upon underlying factual findings.” *Minn. Mining & Mfg. Co. v. Chemque, Inc.*, 303 F.3d 1294, 1301 (Fed. Cir. 2002). Nonetheless, the Court does read the quoted language as potentially anticipating the streamer separation mode of the ‘520

patent. Thus, the Court determines that a factual issue remains, and Plaintiff is not entitled to summary judgment on validity.

ii. Obviousness⁹

A patent claim is invalid “if the differences between the [claimed] subject matter . . . and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person of ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a). “In order to render a claimed apparatus or method obvious [under § 103], the prior art must enable one skilled in the art to make and use the apparatus or method.” *Beckman Instruments, Inc. v. LKB Produkter AB*, 892 F.2d 1547, 1551 (Fed. Cir. 1989). To avoid being obvious, claimed subject matter must be “more than the predictable use of prior art elements according to their established functions.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007). “Obviousness is a question of law based on underlying questions of fact.” *Green Edge Enters., LLC v. Rubber Mulch Etc.*, 620 F.3d 1287, 1298 (Fed. Cir. 2010).

Defendants contend that the Workman Reference, in combination with U.S. Patent No. 4,890,568 (the “Dolengowski Reference” or “Dolengowski”), renders claim 18 obvious, and therefore invalid. The Dolengowski Reference, titled “Steerable Tail Buoy,” was issued on January 2, 1990. (Doc. No. 298-T.) It is presumptively prior art to the ‘520 patent under 35 U.S.C. § 102(b). The Dolengowski Reference discloses remotely controllable tail buoys to maintain the lateral separation of the ends of streamers to avoid entanglement. (*Id.* at col. 2:50-58, col. 7:4-35.)

⁹ Although the Court already has denied Plaintiff’s motion for summary judgment on validity, the Court nonetheless considers Defendants’ arguments regarding obviousness, to the extent these arguments were intended as a motion for summary judgment on obviousness by Defendants.

Plaintiff argues that, beyond the fact that Dolengowski was considered by the USPTO and determined *not* to render the ‘520 patent obvious, it also fails to disclose the patented invention because it does not teach control modes required by the claim. The only expert evidence provided by Defendants is that, while Dolengowski does not “explicitly use the terms ‘feather angle mode,’ ‘turn control mode,’ and ‘streamer separation mode,’ it does teach the challenges of towing multiple streamers to address these modes.” (Garris Expert Report at 70.) Merely teaching the challenges resolved by the patented control modes of the ‘520 patent, without actually solving those challenges in the same way, cannot give rise to obviousness. As Plaintiff’s expert avers, “Dolengowski’s solution to the described problems was merely to use rudders to move tail buoys away from one another.” (Triantafyllou Rebuttal Report ¶ 101.) Dr. Triantafyllou further notes that Dolengowski “does not teach or suggest using a . . . streamer separation mode as taught in the ‘520 patent and construed by the Court.” (*Id.* ¶ 104.) He concludes that Dolengowski “does not anticipate . . . Claim 18 of the ‘520 Patent.” (*Id.* ¶ 101.) Defendants have failed to submit any evidence as to whether the Dolengowski and Workman References—both of which might fail to teach the control modes listed in claim 18¹⁰—enable one skilled in the art to make and use any method within claim 18 of the ‘520 patent. Until the enablement questions are sorted out at trial, substantial underlying questions of fact remain, and summary judgment of nonobviousness should be denied.

C. Written Description Requirement

¹⁰ The Court has determined that there is a factual question as to whether the Workman Reference teaches, and enables, a streamer separation mode. (*See* Part III.B.4.b.i, above.)

Defendants contend that claim 16 of the '017 patent, considered above in the context of indefiniteness, also fails to satisfy the written description requirement. Defendants essentially reiterate their indefiniteness contentions, noting that their arguments as to indefiniteness similarly demonstrate the absence of an adequate written description.

Although written description is a factual issue, the test for compliance with the written description requirement requires an “objective inquiry” into the four corners of the specification from the perspective of a person of ordinary skill in the art. *Ariad*, 598 F.3d at 1351. Based on that inquiry, the specification must describe an invention understandable to that skilled artisan and show that the inventor actually invented the invention claimed. *Id.* Defendants cite no evidence in support of their written description argument. The only relevant evidence that the Court has located is in the expert report of Dr. Garris, who states that “[t]here is no description of what the ‘position predictor software’ consists of.” (Garris Expert Report at 56.) Plaintiff’s expert contends, in contrast, that the written description requirement is satisfied. (Triantafyllou Expert Report ¶ 327.) Dr. Triantafyllou indicates that he disagrees with Dr. Garris “because the ‘017 patent’s specification discusses position prediction. For example, the specification describes using a ‘distributed processing control architecture and behavior-predictive model-based control logic’ in the control system. . . . The specification also discusses the use of such software.” (*Id.*) Written description is a question of fact; where, as here, there is competing expert testimony regarding the perspective of a person of ordinary skill in the art, a genuine issue of material fact remains, and this question must be resolved by the jury.

D. Lack of Enablement

With regard to enablement, Defendants argue (1) that claim 16 of the '017 patent is invalid because the full scope of the claim is not enabled; and (2) that all of the Bittleston patents are invalid because each contains claims having a “streamer positioning device,” which Defendants contend is not enabled.

1. Claim 16 of the '017 patent

Defendants again reassert their indefiniteness arguments in the context of enablement. They urge that there is no disclosure for three of the four elements of claim 16: (1) obtaining a predicted position, (2) calculating the desired changes in the orientation of the wings, using estimated velocity and predicted position, and (3) actuating the wing motors. Here, as in the context of indefiniteness, Defendants provide insufficient evidence regarding whether one of skill in the art, after reading the specification, could practice the claimed invention without undue experimentation. *Sitrick*, 516 F.3d at 999. Thus, like their indefiniteness argument, Defendants' enablement argument as to claim 16 of the '017 patent must fail.

2. All of the Bittleston patents

Defendants also contend that the phrase “streamer positioning device,” used in all of the Bittleston patents, is not enabled, rendering claims in each of the Bittleston patents invalid. Defendants urge that, aside from one figure and one block diagram reciting the results to be obtained, no streamer positioning device is disclosed in the patents.

First, Defendants argue that the Bittleston patents' specifications fail to enable stability in the streamer positioning devices, despite the inventors' knowledge that stability was critical. In an attempt to prove that the inventors knew of the importance of

stability in the streamer positioning devices, Defendants point to the fact that the inventors hired an expert outside contractor to develop software to make the steering device stable. (Hillesund Dep., Doc. No. 273-14 at 286:11-287:6; 412:15-22.) Defendants also cite to Mr. Hillesund's explanation that one method of ensuring stability was to update the angles of the wings on the bird "several times every second" to prevent the bird from "twisting." (Hillesund Dep., Doc. No. 273-15 at 363:15-364:17.) Notwithstanding Mr. Hillesund's recognition of the importance of rapid updating to stability, Defendants argue, the Bittleston patents do not disclose this need. (Hillesund Dep., Doc. No. 273-16 at 365:2-365:12.) Defendants also emphasize the fact that Mr. Hillesund and Dr. Bittleston knew, before filing their patent applications, that the spinning of the bird could become so violent that the wings might need to be blown off the bird body. (Hillesund Dep., Doc. No. 273-20 at 380:13- 381:15; Doc. No. 273-21 at WG00024668.)

Defendants' evidence on the "twisting" issue consists entirely of inventor testimony having nothing to do with the Bittleston patents' text. The credibility of these witnesses, which inherently is at issue, should be judged at trial. As with a number of Defendants' arguments, no expert testimony is cited, and the Court has been unable to find any that is persuasive on this issue. On the other hand, Plaintiff's expert has opined that the Bittleston patents do enable streamer positioning devices. (Triantafyllou Decl. ¶ 27.) Defendants' own expert, Mr. Brune, similarly has affirmed that the Bittleston '895 application discloses and enables an active streamer positioning device or a master controller. (Brune Dep., Doc. No. 287-16 at 66:25-67:6.) Mr. Brune's report mentions non-enablement only as to the '038 and '607 patents, but gives no rationale whatsoever

for his opinion. (Brune Expert Report at 20-21.) Dr. Garris does not discuss enablement of a streamer positioning device at all. As to the Bittleston patents' enablement of a streamer positioning device, the expert evidence is conflicting, and Defendants fail to demonstrate that a person of ordinary skill in the art, after reading the specification, could not practice the claimed invention without undue experimentation. *Sitrick*, 516 F.3d at 999.

Defendants also argue that the Bittleston patents fail to disclose a system for locating the positions of the streamer positioning devices. Defendants highlight Mr. Hillesund's testimony that the lack of an accurate system for locating the positions of the streamer positioning devices would have made the use of lateral steering "possibly impossible to implement." (Hillesund Dep., Doc. No. 287-36 at 296:9–297:15.) Again, Defendants offer no expert testimony in support of their argument, and fail to prove that the claimed "streamer positioning device" requires a system for locating the positions of the streamer positioning devices. The burden to prove non-enablement is on Defendants, and they have failed to meet it at this juncture.

E. Best Mode Requirement

Finally, Defendants claim that the inventors of the Bittleston patents knew, but did not disclose, better modes of carrying out the Bittleston patents. Defendants proffer essentially the same arguments used to challenge the enablement of the Bittleston patents. Defendants first contend that streamer positioning devices need modes that the inventors did not disclose. Specifically, Defendants point to the importance, acknowledged by Mr. Hillesund, of preventing streamer positioning devices from twisting. Defendants also contend that WesternGeco's later-completed acoustic positioning system for measuring

the locations of streamer positioning devices is not mentioned in the patents, despite the fact that the inventors “knew what positioning system they were going to try to use.” (Doc. No. 273 at 22.) Defendants also offer evidence that the inventors worked on addressing these two problems—the need for additional modes and the need for an acoustic positioning system—as late as 2005. What Defendants fail to prove is that Dr. Bittleston or Mr. Hillesund knew of a better mode *in 1998* and failed to disclose it.

Perhaps even more problematically, Defendants also fail to prove that the functionality of the alleged best modes—anti-twist methods, fail-safe explosives, and an acoustic positioning system for measuring the locations of streamer positioning devices—is within the scope of Bittleston patents. *Cf. AllVoice Computing PLC v. Nuance Communications, Inc.*, 504 F.3d 1236, 1248 (Fed. Cir. 2007) (“Because the functionality of the alleged best mode falls outside the scope of claim 73, this court detects no violation of the best mode requirement with respect to claim 73.”). The “best mode” analysis is a question of fact, and Defendants have failed to meet their burden of proving, by clear and convincing evidence, that the inventors of the Bittleston patents “knew of and concealed a better mode of carrying out the claimed invention than that set forth in the specification.” *Teleflex*, 299 F.3d at 1330.

IV. INVALIDITY OF APPARATUS CLAIMS OF THE ZAJAC PATENT

Defendants move for summary judgment of invalidity as to claims 1, 3, 4, 11, and 14 of the Zajac patent on the basis that these claims fail to meet the written description and enablement requirements of 35 U.S.C. § 112, and, as to claims 4 and 14, on the basis that they fail to meet that Section’s definiteness requirement.

A. Timeliness of Defenses

Plaintiff again urges that Defendants' invalidity defenses are untimely, as they have not been presented to Plaintiff other than in an overly broad pleading. For the reasons discussed in Part III.A, above, the Court declines to deny this motion for untimeliness.

B. Written Description Requirement

Defendants contend that claims 1, 3, 4, 11, and 14 fail to satisfy the written description requirement because the written description fails to (1) describe an active streamer positioning device ("ASPD"); (2) describe a master controller for issuing positioning commands to each ASPD to adjust a vertical and horizontal position for maintaining a specified array geometry; and (3) describe a master controller that issues positioning commands to ASPDs to maintain the desired streamer positions and array geometry versus time. As discussed above, a claim that includes functional language must disclose a correlation between the function and a structure. *Boston Sci. Corp.*, 647 F.3d at 1365. A patentee can rely on information that is "well-known in the art" to satisfy the written description requirement. *Id.* at 1366. However, where the "four corners of the specification directly contradict information that the patentee alleges is 'well-known' to a person of skill at the effective filing date, no reasonable jury could conclude that the patentee possessed the invention." *Streck, Inc. v. Research & Diagnostic Sys., Inc.*, 665 F.3d 1269, 1285 (Fed. Cir. 2012).

1. Failure to describe an ASPD

Claims 1, 3, 4, 11, and 14 of the Zajac patent each claim, as a part of the invention, "an active streamer positioning device." This term has been construed by the Court to mean "a device capable of controlling the vertical and horizontal position of the

seismic streamer.” (Doc. No. 120 at 46.) Defendants contend that nothing in the specification of the Zajac patent explains what an ASPD is, or how to make or use one. Defendants maintain that ASPDs are discussed in the specification only in the context of the results they achieve, and not their structure. Defendants highlight, as an example, the following language in the Zajac patent:

Located between the deflector 16 and the tail buoy 20 are a plurality of ASPDs 18. Preferably the ASPDs 18 are both vertically and horizontally steerable. These ASPDs 18 may, for instance, be located at regular intervals along the individual streamers, such as every 200 to 400 meters. The vertically and horizontally steerable ASPDs 18 can be used to constrain and configure the shape of the seismic streamer 12 between deflector 16 and the tail buoy 20 in the vertical (z or depth) and horizontal (x, y) directions. The ASPDs 18 can be placed at the head end of a streamer, at the tail end of the streamer or at any place along the streamer in between the streamer head end and streamer tail end.

(Doc. No. 270-1 at col. 7, ln. 1-12.) Defendants also point out that the specification does not include a drawing of the ASPD; they contend that, from reading the language within the four corners of the Zajac patent, the public knows that an ASPD is meant to control the vertical and horizontal position of the streamer, but does not know what structure an ASPD uses to accomplish that result.

Defendants err in focusing on what the public would understand by looking at these patents, as the proper inquiry is what would be understood by a person of ordinary skill in the art. *Ariad*, 598 F.3d at 1351. Both Dr. Thomas Edgar, ION’s technical expert, and Dr. Triantafyllou, WesternGeco’s technical expert, confirm that, at the time the Zajac patent was filed, those skilled in the art of marine seismic surveying were familiar with ASPDs, or “birds.” (Edgar Dep., Doc. No. 288-11 at 106:17-107:24; Triantafyllou Decl. ¶¶ 7-9, 13, 325.) In *Biomedino*, 490 F.3d 946, the Federal Circuit explained that, although

“the patentee need not disclose the details of structures well known in the art, the specification must nonetheless disclose some structure.” *Id.* at 952 (citation omitted). The Court has construed ASPD as having corresponding structure. Combining the teachings in the Zajac specification with what was well-known to a person of ordinary skill in the art, the Court cannot conclude that the written description of ASPD is insufficient. *Cf. Am. Med. Sys.*, 712 F. Supp. 2d at 913 (denying summary judgment on patent invalidity because plaintiff’s expert described how a person of ordinary skill in the art would view the correlation between structure and function). Thus, Defendants have failed to meet their burden of proving the insufficiency of the written description by clear and convincing evidence.

2. Failure to recite “a master controller for issuing positioning commands to each ASPD to adjust a vertical and horizontal position . . . for maintaining a specified array geometry”

Claims 1, 3, 4, and 11 of the Zajac patent each claim, as a part of the invention “a master controller for issuing positioning commands to each ASPD to adjust a vertical and horizontal position . . . for maintaining a specified array geometry.” (Zajac patent at claims 1, 3, 4, 11.) Because this language represents an apparatus (a “master controller”) claimed using functional language (“for issuing positioning commands”), the specification must disclose a structure correlated with the claimed function in order to meet the written description requirement. *See Boston Sci. Corp.*, 647 F.3d at 1365. The Court has construed master controller to mean “a controller that sends commands to other devices in a system.” (Doc. No. 120 at 35, 44.)

Defendants contend that nothing in the specification of the Zajac patent explains what a master controller is, or how to make or use a master controller to issue positioning

commands to each ASPD for maintaining a specified array geometry. Defendants cite, as an example, the following language from the specification: “The master controller 26 then determines, in light of the current environmental conditions and the maneuverability of the vessel, ASPDs and towed streamers comprising the array, the timing and magnitude of positioning commands to be sent to the ASPDs on the array.” (Zajac patent at col. 8, ln. 31-35.) Defendants contend that this explains what the master controller determines—the timing and magnitude of positioning commands—but not *how* the master controller makes such a determination.

Plaintiff responds first that the Bittleston ‘895 application, referenced in the Zajac patent, teaches a “global control system,” which is a type of master controller. ION’s technical expert, Mr. Brune, has confirmed that the ‘895 application discloses and enables a “master controller” that corresponds to the term as used in the Zajac patent. (Brune Dep. at 65:21-67:6, 72:1-16.)¹¹ Even more favorable for Plaintiff is the testimony of ION expert Dr. Edgar, who has explained that the idea of using a controller to send

¹¹ The parties do not dispute that material incorporated by reference can be used to support a patentee’s enablement arguments. *See, e.g., Streck*, 665 F.3d at 1289-92 (“[T]he specification, and the ‘089 Patent incorporated by reference therein, support [plaintiff’s] position.”) However, Defendants contend that the ‘895 application cannot be considered, as it was not incorporated by reference into the Zajac patent because the words “incorporation by reference” were not used. A regulation promulgated on September 21, 2004 requires “using the root words ‘incorporat(e)’ and ‘reference’” in order to incorporate another patent, application, or publication into a specification. 37 C.F.R. § 1.57(b). In supplemental briefing submitted at the Court’s request, Plaintiff contends that this regulation does not apply, as it was promulgated after the Zajac patent issued. Neither party has offered any legal support for its position as to the retroactive or non-retroactive application of this regulation. The Fifth Circuit has held that “administrative rules should not be construed as having retroactive effect unless their language requires that result.” *Carpenters Dist. Council of New Orleans & Vicinity v. Dillard Dept. Stores, Inc.*, 15 F.3d 1275, 1291 (5th Cir. 1994) (citing *Sierra Medical Ctr. v. Sullivan*, 902 F.2d 388, 392 (5th Cir. 1990)). The Court interprets this regulation not to be retroactive; were it retroactive, patentees who relied on legal standards in effect at the time their invention was patented would later be unable to use properly incorporated material to defend against invalidity charges. However, even if this material were *not* incorporated by reference, it would nonetheless comprise prior art to the Zajac patent, which would support Plaintiff’s theory, confirmed by ION’s expert, that ASPDs were well known in the art.

commands to other devices in a system was known to those of skill in the art at the time of the Zajac patent. (Edgar Dep. at 107:25-108:17.) Defendants fail to offer any expert evidence in support of their argument, and the testimony of ION's own experts, Mr. Brune and Dr. Edgar, counsels against it.

3. Failure to describe “a master controller that issues positioning commands to the ASPDs to maintain the desired streamer positions and array geometry versus time”

Claim 14 of the Zajac patent claims the following: “wherein the master controller . . . issues positioning commands to the ASPDs to maintain the desired streamer positions and array geometry versus time.” ('038 patent at claim 14.) As above, this is an apparatus claimed using functional language, which, in order to meet the written description requirement, must disclose a corresponding structure. *Boston Sci. Corp.*, 647 F.3d at 1365. The Court construed “positioning commands” to mean “signals or instructions to control positioning,” and “maintaining a specified array geometry” to mean “maintaining a specified array shape.” (Doc. No. 120 at 46.)

Defendants again urge that nothing in the specification of the Zajac patent explains what a master controller is, or how to make or use one to issue positioning commands to each ASPD to maintain the desired streamer positions and array geometry versus time. Plaintiff reiterates that one skilled in the art would know what a master controller was, and that the patent cross-references two related patent applications that describe master controllers. For the reasons discussed above, Defendants fail to prove this argument by clear and convincing evidence at this juncture, so their motion must be denied.

C. Enablement Requirement

Defendants contend that the Zajac patent fails to enable the same language challenged above under the written description requirement. The Federal Circuit has explained that, “[i]f an invention pertains to an art where the results are predictable[,] . . . a broad claim can be enabled by disclosure of a single embodiment, and is not invalid for lack of enablement simply because it reads on another embodiment of the invention which is inadequately disclosed.” *Spectra-Physics, Inc. v. Coherent, Inc.*, 827 F.2d 1524, 1533 (Fed. Cir. 1987) (citations omitted); *see also Invitrogen Corp. v. Clontech Labs., Inc.*, 429 F.3d 1052, 1071 (Fed. Cir. 2005) (“Enablement does not require the inventor to foresee every means of implementing an invention at pains of losing his patent franchise.”). It is also clear that enablement entails many factual aspects. *See In re Wands*, 858 F.2d at 737 (“Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations. . . . Factors to be considered . . . include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.”). Expert testimony that a person in ordinary skill in the art would know how to make and use the claimed invention can give rise to a fact issue on questions of enablement. *Cf. Am. Med. Sys.*, 712 F. Supp. 2d at 914.

1. Failure to enable an ASPD

Defendants repeat their arguments as to why an ASPD is not adequately recited. However, for the reasons discussed above, the Court concludes that a genuine issue of

material fact remains as to whether those skilled in the art would know how to make and use an ASPD. Though Defendants acknowledge that courts considering enablement should look to the factors laid out in *Wands*, 858 F.2d at 737, they fail to address how any of these factors counsels in favor of their non-enablement argument. Defendants fail to establish, by clear and convincing evidence, that an ASPD was not enabled. Because Defendants have offered insufficient evidence to resolve the fact questions underlying the enablement inquiry, summary judgment must be denied.

2. Failure to enable a master controller for issuing positioning commands to each ASPD to adjust a vertical and a horizontal position

Again, without citing any evidence in support of their argument, Defendants contend that the Zajac patent fails to enable a master controller for issuing positioning commands to each ASPD to adjust a vertical and a horizontal position. For the reasons discussed above with regard to the written description of this language, Defendants have failed to meet their burden, and summary judgment must be denied.

3. Failure to enable a master controller that issues positioning commands to the ASPDs to maintain the desired streamer positions and array geometry versus time

Defendants offer no further evidence in support of this argument. For the reasons discussed above, factual issues remain, and summary judgment must be denied.

D. Definiteness Requirement

Defendants also move for summary judgment of indefiniteness as to claims 4 and 14. As discussed above, claims are considered indefinite when they are “not amenable to construction or are insolubly ambiguous.” *Young*, 492 F.3d at 1346. Claim 4 of the Zajac patent contains the limitation: “wherein the master controller compares the positions of

the streamers versus time and the array geometry versus time to a desired streamer position and array geometry versus time and issues positioning commands to the ASPDs to maintain the desired streamer position and array geometry versus time.” (‘038 patent at claim 4.) Claim 14 contains a similar limitation: “wherein the master controller compares the vertical and horizontal positions of the streamers versus time and the array geometry versus time to desired streamer positions and array geometry versus time and issues positioning commands to the ASPDs to maintain the desired streamer positions and array geometry versus time.” (‘038 patent at claim 14.) Defendants contend that these claims fail to distinctly claim the invention because their use of method steps within an apparatus claim makes it impossible to tell whether the claims are infringed when a device is manufactured, or only when it is used.

In support of their argument, Defendants cite to *IPXL*, 430 F.3d 1377, and *Katz*, 639 F.3d 1303. The Court discussed these cases in addressing Defendants’ allegations of indefiniteness with regard to claim 15 of the ‘967 patent, above. Defendants’ argument fails here for the same reason.

The language at issue in claims 4 and 14 is distinguishable from the language at issue in *IPXL* and *Katz*, and looks much more like the language at issue in *Microprocessor*, 520 F.3d at 1375, *Yodlee*, 2006 WL 3456610, *Eolas*, 810 F. Supp. 2d at 812, and *Toshiba*, 2006 WL 1788479. The functional language in these claims recites the capability of the claimed invention, rather than how a user is to perform a method for using that invention. The language at issue here does not refer to steps a user takes to utilize the invention. Rather, the verbs “compares” and “to maintain” describe capabilities of the master controller itself. Plaintiff’s expert confirms what seems clear

from the face of the patent—that the limitations in claims 4 and 14 “refer[] to a capability of the master controller, not a specific action taken by a user of the system.” (Triantafyllou Decl. at ¶¶ 15-16.) A genuine issue of material fact remains as to the indefiniteness of claims 4 and 14 of the Zajac patent.

INFRINGEMENT MOTIONS

I. BACKGROUND

At issue in these motions is whether the Fugro Defendants and ION infringed on a number of WesternGeco’s patents. All of the allegedly infringing products at issue in this litigation (the “Accused Products”) are ION products; the Fugro Defendants are alleged only to have used these infringing products. The Defendants move jointly for summary judgment as to whether these ION Accused Products infringed on WesternGeco’s patents.

In their Motion for Partial Summary Judgment as to the Invalidity of Claims of the Hillesund Patents for Violation of 35 U.S.C. § 112 (Doc. No. 273), Defendants move for summary judgment on a number of apparatus claims, including claim 16 of the ‘017 patent; claim 15 of the ‘607 patent; claim 15 of ‘967 patent; and claim 18 of the ‘520 patent. Plaintiff cross-moves for summary judgment on the ‘520 patent, seeking summary judgment both that the patent was infringed, and that it was infringed willfully. (Doc. No. 276.) Finally, in Defendants’ Motion for Summary Judgment of Non-Infringement of WesternGeco’s System Claims of its ‘038 Patent, Defendants move for summary judgment of non-infringement on claims 1, 3, 4, 11, and 14 of the Zajac patent.

II. LEGAL STANDARDS

A. Direct Infringement under 35 U.S.C. § 271(a)

Section 271(a) states that a patent claim is directly infringed if, without authority, a person “makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefore.” 35 U.S.C. § 271(a). The determination of whether an accused product infringes a patent claim involves two steps: (1) a court must construe the claim terms, as a matter of law, to determine their proper scope; and (2) the claim, as properly construed, must be compared to the accused device. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995), *aff’d* 517 U.S. 370 (1996).

While infringement is a question of fact, the underlying claim construction is a question of law. *Bai v. L&L Wings, Inc.*, 160 F.3d 1350, 1353 (Fed. Cir. 1998); *Markman*, 52 F.3d at 976. “An infringement issue is properly decided upon summary judgment when no reasonable jury could find that every limitation recited in the properly construed claim either is or is not found in the accused device either literally or under the doctrine of equivalents.” *Gart v. Logitech, Inc.*, 254 F.3d 1334, 1339 (Fed. Cir. 2001) (citing *Bai*, 160 F.3d at 1353).

1. Literal infringement

“To establish literal infringement, all of the elements of the claim, as correctly construed, must be present in the accused system.” *Networld, LLC v. Centraal Corp.*, 242 F.3d 1347, 1353 (Fed. Cir. 2001). “Literal infringement of a means-plus-function claim limitation requires that the relevant structure in the accused device perform the identical function recited in the claim and be identical or equivalent to the corresponding structure in the specification.” *Applied Med. Res. Corp. v. U.S. Surgical Corp.*, 448 F.3d 1324, 1333 (Fed. Cir. 2006) (citing *Lockheed Martin Corp. v. Space Sys./Loral, Inc.*, 324 F.3d

1308, 1320 (Fed. Cir. 2003)). Summary judgment on literal infringement is proper “when no genuine issue of material fact exists, in particular, when no reasonable jury could find that every limitation recited in the properly construed claim either is or is not found in the accused device.” *Goldenberg v. Cytogen, Inc.*, 373 F.3d 1158, 1164 (Fed. Cir. 2004) (quoting *Bai*, 160 F.3d at 1353) (internal quotation marks omitted).

2. Infringement under the Doctrine of Equivalents

Even if a device does not literally infringe a claim, it “may nonetheless infringe under the doctrine of equivalents if every element in the claim is literally or equivalently present in the accused device.” *Sage Prods., Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1423 (Fed. Cir. 1997) (citing *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 934-35 (Fed. Cir. 1987)). “The doctrine [of equivalents] evolved in recognition of the fact that ‘[t]he language in the patent claims may not capture every nuance of the invention or describe with complete precision the range of its novelty.’” *Freedman Seating Co. v. Am. Seating Co.*, 420 F.3d 1350, 1357-58 (Fed. Cir. 2005) (quoting *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731 (2002)). The doctrine is meant to prevent “the unscrupulous copyist [from making] unimportant and insubstantial changes and substitutions in the patent which, though adding nothing, would be enough to take the copied matter outside the claim, and hence outside the reach of law.” *Graver Tank & Mfg. Co. et al. v. Linde Air Prods. Co.*, 339 U.S. 605, 607 (1950).

In considering whether a device infringes under the doctrine of equivalents, courts determine whether the “two devices do the same work in substantially the same way, and accomplish substantially the same result.” *Id.* at 608 (quoting *Union Paper-Bag Mach. Co. v. Murphy*, 97 U.S. 120, 125 (1877)). In order to proceed with a claim under the

doctrine, a patent holder must show that the accused device includes the equivalent of each claim limitation. *Dawn Equip. Co. v. Ky. Farms, Inc.*, 140 F.3d 1009, 1015 (Fed. Cir. 1998). “Although equivalence is a factual matter normally reserved for a fact finder, the trial court should grant summary judgment in any case where no reasonable fact finder could find equivalence.” *Sage Prods., Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1423 (Fed. Cir. 1997).

B. Indirect Infringement under 35 U.S.C. §§ 271(b) and (c)

A party’s acts may constitute indirect infringement under 35 U.S.C. §§ 271(b) and (c) if a party actively induces or contributes to infringement. *Joy Techs., Inc. v. Flakt, Inc.*, 6 F.3d 770, 774 (Fed. Cir. 1993). There cannot be indirect infringement absent direct infringement. *Id.* (“Liability for either active inducement of infringement or for contributory infringement is dependent upon the existence of direct infringement.” (citations omitted)).

C. Infringement under 35 U.S.C. § 271(f)

Under 35 U.S.C. § 271(f)(1), liability exists for one who “supplies or causes to be supplied in or from the United States” one or more components of a patented invention “where such components are uncombined in whole or in part, in such a manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States.” 35 U.S.C. § 271(f)(1). Section 271(f)(2) provides for liability as against persons who supply or cause to be supplied “in or from the United States any component of a patented invention that is especially made or especially adapted for use in the invention and not a staple article or commodity of commerce suitable for substantial noninfringing

use . . . knowing that such component is so made or adapted and intending that such component will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States.” 35 U.S.C. § 271(f)(2).

III. NON-INFRINGEMENT OF BITTLESTON APPARATUS CLAIMS

Defendants move for summary judgment of non-infringement regarding four of the WesternGeco patents at issue in this litigation, including the ‘017 patent, the ‘607 patent, the ‘967 patent, and the ‘520 patent. Plaintiff cross-moves for summary judgment of willful infringement of the ‘520 patent.

As noted above, the determination of whether an accused product infringes a patent claim involves first conducting claim construction, and then comparing the claim, as properly construed, to the accused device. *Markman*, 52 F.3d at 976. On July 16, 2010, the Court issued an order construing a number of claims at issue in this case. (Doc. No. 120.) The Court construed the following terms relevant to this motion:

CLAIM TERM	COURT’S CONSTRUCTION
“streamer positioning device(s)”; “the positioning device”	“a device that controls the position of a streamer as it is towed (<i>e.g.</i> , a ‘bird’)” (Doc. No. 120 at 16)
“global control system”	“a control system that sends commands to other devices in a system (<i>e.g.</i> , local control systems)” (<i>Id.</i> at 19)
“local control system”	“a control system located on or near the streamer positioning devices (<i>e.g.</i> , birds)” (<i>Id.</i> at 19)
“location information”	“information regarding location” (<i>Id.</i> at 22)
“means for obtaining a predicted position of the streamer positioning devices”	“global control system and predictor software; and equivalents thereof” (<i>Id.</i> at 29)
“means for obtaining an estimated velocity of the streamer positioning devices”	“flowmeters; water velocity sensors; and equivalents thereof” (<i>Id.</i> at 31)
“means for calculating desired changes in the orientations of the respective wings of at least some of the streamer positioning	“global control system; local control system and localized displacement/force conversion program using a look-up table

devices using said predicted position and said estimated velocity”	or a conversion routine; and equivalents thereof” (<i>Id.</i> at 32)
“turn control mode”	“mode wherein streamer positioning device(s) generate a force in the opposite direction of a turn and then directing each streamer positioning device to the position defined in the feather angle mode” (<i>Id.</i> at 26-27)

At a hearing held on December 15, 2011, the parties agreed that the term “estimated velocity” is properly construed as “estimate of speed and direction.” (Doc. No. 272-E.)

At the same hearing, the Court considered the Fugro Defendants’ request for construction of the terms “predicted position(s)” and “predict positions,” as well other claim language using the word “predict.” (Doc. No. 181 at 13, 18.) The Fugro Defendants asked the Court construe terms including the word predict to include the phrase “at a future time”; they urged that the word predict is different than the word estimate, in that it requires determining something about a future time. (*Id.* at 14.) The Court declined to construe the additional terms raised by the Fugro Defendants.

Defendants contend that Plaintiff’s allegations of infringement of the apparatus claims of the ‘017, ‘607, ‘967, and ‘520 patents fail because ION’s towed streamer system does not contain every limitation of these apparatus claims, either literally or under the doctrine of equivalents.

A. Claim 16 of the ‘017 Patent

Claim 16 of the ‘017 patent is comprised of means-plus-function limitations, as defined by 35 U.S.C. § 112 ¶ 6. To infringe claim 16, a system must include the following elements: (1) “means for obtaining a predicted position of the streamer positioning device”; (2) “means for obtaining an estimated velocity of the streamer

positioning device”; and (3) means for using the predicted position and estimated velocity to “calculate[] desired changes in the orientations of the respective wings of at least some of the streamer positioning devices.” (‘017 patent at claim 16.) Defendants argue that none of the ION Accused Products includes the foregoing limitations, either literally or under the doctrine of equivalents.

1. “Means for obtaining a predicted position”

Claim 16 of the ‘017 patent states that the apparatus must perform the function of “obtaining a predicted position of the streamer positioning devices.” (‘017 patent.) The Court has held that the structures that perform this limitation include “global control system and predictor software; and equivalents thereof.” (Doc. No. 120 at 29). To satisfy this limitation, an ION Accused Product must have one of the structures identified by the Court, or must have an equivalent structure able to perform the function of obtaining a predicted position of the streamer positioning devices.

Defendants admit that ION’s DigiFIN product is a streamer positioning device (“SPD”), as defined by the Court. However, they contend that the DigiFIN does not “predict” a position, as it cannot calculate a location at a future time. Testimony by ION’s ORCA Software Project Manager, Crawford Macnab, confirms that the DigiFIN estimates where it believes the SPDs are located based exclusively on historical information; according to Mr. Macnab, ION’s technology “is not predictive.” (Macnab Decl., Doc. No. 272-J ¶¶ 6-8.) Defendants argue that ION’s ORCA and Spectra systems similarly are not “predictive,” but instead are responsive or reactive. According to Defendants, all of these systems determine an estimated current location of SPDs based

on historical information, and do not “predict” the future location of an SPD. (*Id.* ¶¶ 5-8; Cole Decl., Doc. No. 291-28 ¶¶ 3-9.)

Plaintiff contends that ION’s Accused Products do include a means for obtaining a predicted position. Specifically, Plaintiff argues that ION’s ORCA product includes software—namely, the “Kalman filter”—that predicts positions. Plaintiff points to deposition testimony of Mr. Macnab, who confirms that the Kalman filter “is predicting the position of the DigiFIN devices.” (Macnab Dep., Doc. No. 291-22 at 199:8-13.) Plaintiff also cites a document describing algorithms related to the Kalman filter, which states that the Kalman filter uses raw data “to update its position . . . estimates” (Doc. No. 291-27 at 5), and that outputs from the Kalman filter are passed to the “shot predictor,” which “believes what the filter tells it about position & velocity.” (*Id.*)

One of Plaintiff’s experts, John J. Leonard, testifies that the Kalman filter “repeatedly predicts positions and estimates the positions and velocities of the nodes in streamer arrays. The ORCA-APSL module of ORCA uses the positions of streamer array elements estimated by the [Kalman filter] to compute separations between streamers and transmits this information to the Lateral Controller.” (Leonard Updated Opening Report, Doc. No. 291-13 at ¶ 8.) Dr. Leonard also explains that “[t]he ORCA source code contains a module called the NCN (Network Calculation Node) that uses a Kalman filter to predict the positions and estimate the velocities of the nodes within the streamer array.” (*Id.* ¶ 17.) Indeed, ORCA’s source code includes the following notation: “perform a prediction/adjustment sequence, updating the filter.” (Doc. No. 291-26 at IONSC4402.) Dr. Leonard refers to the Kalman filter’s ability to “predict” several more times throughout his report. (*Id.* ¶¶ 18-42, 53 (indicating that the Kalman filter performs “a

prediction/adjustment sequence”; that the Kalman produces an estimation in two steps, the first of which is “prediction”; and referring to prediction as a “necessary” function for the Kalman filter).) Finally, Dr. Leonard states that certain files in the ORCA “describe data items that relate to the prediction of the future positions of streamers.” (*Id.*) Dr. Triantafyllou, another WesternGeco expert, opines that ION’s ORCA product “houses position prediction software that obtains predicted position of the streamer positioning devices.” (Triantafyllou Opening Report, Doc. No. 291-12 at ¶ 131.) He explains that this software is housed within the Kalman filter, and that it “obtains predicted positions of the DigiFINs—the Lateral Controller then obtains this information to control the DigiFINs.” (*Id.*)

In response to Plaintiff’s evidence, Defendants offer the testimony of Joe Tipton Cole, an ION expert, who submits in his report that Dr. Leonard’s reliance on the common terminology of the Kalman filter—specifically, the term “prediction step”—as the basis for describing the Kalman filter’s calculations as “predictions,” is flawed. (Cole. Decl. ¶ 20.) Mr. Cole explains that the characterization is faulty because the Kalman filter’s calculations operate “exclusively on pre-existing data and never depend on future values.” (*Id.*) However, ION expert Mr. Brune suggests that prediction in the Kalman filter *does* relate to the future. When asked why the Kalman filter would use past data to predict a measurement for the present time, he explained that “[y]ou might be better to use past positions and to *make a forecast or prediction* of what they indicate and combine that in some fashion statistically with new measurements to get an overall best estimate.” (Brune Dep., Doc. No. 291-29 at 98:9-100:7.)

The competing expert testimony from Plaintiff and Defendants creates a genuine issue of material fact as to whether the ORCA includes a means for obtaining a predicted position. It is undisputed that the Kalman filter's source code uses the term "prediction" to define what it does. Defendants make much of the fact that the Kalman filter does not actually "predict" in the sense that it does not depend on future values, and instead relies on historical data. However, this Court specifically rejected the Fugro Defendants' request that the Court construe the term "predict" to require something occurring at a "future time." Moreover, Defendants have not persuaded the Court that one meaning should be attributed to the term "predict" when it is used in WesternGeco's patents, but that an entirely different meaning applies to the world as used in the Kalman filter's source code. Ultimately, the expert testimony, including testimony from ION's own expert, suggests that such divergence between the two meanings may not exist. Because a reasonable juror could find that the ORCA obtains a predicted position, summary judgment on this issue must be denied.

2. "Means for obtaining an estimated velocity"

Claim 16 of the '017 patent also must perform the function of "obtaining an estimated velocity of the streamer positioning devices." ('017 patent at claim 16.) The Court has held that the structures that perform this limitation include "flowmeters; water velocity sensors; and equivalents thereof." (Doc. No. 120 at 31.) Defendants contend that, though ION has products that estimate the velocity of SPDs, it does not literally infringe because it does not use flowmeters or water velocity sensors to perform that estimation. According to Mr. Brune, ION calculates the estimated velocity of the SPDs over the ground, using ION's ORCA position and control system, rather than through the water.

(Brune Decl., Doc. No. 272-H ¶ 5.) Mr. Brune avers that ION's method of calculating estimated velocity using different positions over time is not equivalent to the flowmeter and water velocity sensor structures identified by the Court. (*Id.* ¶¶ 6-8.)

Plaintiff responds that ION's means for estimating velocity, including its Model 7500 Speed Logs, are equivalent to the flowmeters used by WesternGeco, as they similarly calculate velocities through the water. Plaintiff points to the testimony of ION employee Clement Guillot, who explains that speed logs "measure the actual speed [of the streamer] through the water." (Guillot Dep., Doc. No. 291-24 at 223:21-224:4, 133:11-20; *see also* Alfsen Dep., Doc. No. 291-30 at 84:12-25.) Mr. Brune confirms that a speed log measures "one vector component of water velocity." (Doc. No. 291-31 ¶ 34.) David Moffatt, ION's Senior Vice President in charge of Marine Imaging Systems, indicates that ORCA receives velocity information in the form of "speed log information." (Moffatt Dep., Doc. No. 291-20 at 60:5-9.)

In addition to considering speed log information, ION and Fugro employees testify that ORCA takes into account velocity information from compasses. (Guillot Dep. at 223:9-20; Moffatt Dep. at 47:16-22; Evanger Dep., Doc. No. 291-32 at 32:22-33:7.) Plaintiff's expert, Dr. Triantafyllou, confirms that ORCA uses various observations to obtain an estimated velocity of the DigiFINs deployed in an array. (Triantafyllou Opening Report ¶¶ 132-34.) Dr. Triantafyllou states that compasses and speed logs *are* flowmeters, or equivalents thereof, which obtain an estimated velocity of the streamers and the equipment on the streamers. (*Id.* ¶ 134.)

This Court lacks the technical expertise to determine whether it is Mr. Brune or Dr. Triantafyllou who more accurately characterizes the ION technology. However,

because testimony from a number of Defendants’ employees confirms that speed logs measure streamer speed through the water, it is clear that the distinction drawn by Defendants—that Plaintiff’s products measure velocity through the water, whereas ION’s products calculate estimated velocities of the SPDs over the ground—is not entirely accurate. On the evidence now before the Court, a genuine issue of material fact remains as to whether ION’s method of estimating velocity includes either flowmeters, or equivalents thereof.

3. Means for using the predicted position and estimated velocity to calculate desired changes in wing orientation based on predicted position or estimated velocity

Claim 16 of the ‘017 patent also must perform the function of “calculating desired changes in the orientations of the respective wings of at least some of the streamer positioning devices using said predicted position and said estimated velocity.” (‘017 patent at claim 16.) The Court construed this phrase to mean “global control system; local control system and localized displacement/force conversion program using a look-up table or a conversion routine; and equivalents thereof.” (Doc. No. 120 at 32.)

Defendants reiterate that no ION Accused Product predicts future locations of a DigiFIN, and that the function of calculating desired changes in the orientations of the respective wings therefore cannot be performed using “predicted” positions of the SPDs. The Court rejects Defendants’ argument for the reasons discussed above, as it has concluded that a genuine issue of material fact remains as to whether ION’s Accused Products include a predictive component.

Defendants further maintain that, although ION’s Accused Products are *capable* of obtaining an estimated velocity of a DigiFIN by using a calculation, no ION Accused

Product uses that calculated estimated velocity information to change a DigiFIN's wing orientation. Mr. Macnab testifies that ION's navigation systems are not capable of passing velocity information to the lateral controller or to the DigiFINs and that, as a result, "ION's streamer system does not, and cannot, use estimated velocity of an SPD in order to calculate desired changes in wing orientation of an SPD." (Macnab Decl. ¶ 9.) Mr. Brune testifies that ION's method of calculating wing angle uses neither predicted positions nor estimated velocity. (Brune Decl. ¶ 9.)

Plaintiff disputes Defendants' depiction of ION's navigation systems as incapable of passing velocity information to the lateral controller. WesternGeco's expert, Dr. Leonard, explains that ION's "lateral controller uses the streamer separation information computed by ORCA to specify and transmit commanded fin angles to each DigiFIN." (Doc. No. 291-13 ¶ 8.) Dr. Leonard proceeds to analyze the source code that is used to produce these functions. (*Id.* ¶¶ 49, 54-57.)

In his deposition, Macnab confirmed that "ORCA provides location information regarding the DigiFINS to the lateral controller," and then "the lateral controller . . . process[es] the location information and use[s] that to control the DigiFINS." (Macnab Dep. at 140:23-141:6.) Mr. Macnab agreed that "ORCA sends location information to the lateral controller and the lateral controller manipulates that location information and sends it on to the DigiFINs in order to achieve desired steering or desired separation." (*Id.* at 141:18-23.) This testimony evidences the sending of location information—which the Court has already concluded ION may derive from using predicted locations and estimated velocities—to a lateral controller, which uses the information to communicate desired wing position to the DigiFIN.

As above, the Court finds competing evidence here, giving rise to a factual dispute. If Plaintiff's evidence is to be believed, then ION's ORCA includes a means for using the predicted position and estimated velocity to calculate desired changes in wing orientation based on those predicted positions and estimated velocities. Such a process would infringe on WesternGeco's "means for using the predicted position and estimated velocity to calculate desired changes in wing orientation based on predicted position or estimated velocity." In light of the foregoing, Defendants' motion for summary judgment of non-infringement of claim 16 of the '017 patent must be denied.

B. Claim 15 of the '607 Patent

Claim 15 of the '607 patent includes the following limitations: "a prediction unit adapted to predict positions of at least some of the streamer positioning devices," and "a control unit adapted to use the predicted positions to calculate desired changes in positions of one or more of the streamer positioning devices." ('607 patent at claim 15.) Defendants contend that none of ION's Accused Products, alone or in combination with any other ION Accused Products, includes a prediction unit adapted to predict positions of at least some of the streamer positioning devices. In support of this contention, Defendants cite to the Declarations of Mr. Cole and Mr. Macnab. (Cole Decl. ¶¶ 4-9 (indicating that the Kalman filter does not perform a predicting function, and therefore cannot change the wing orientation of an SPD by using a predicted location); Macnab Decl. ¶¶ 5-8.) The Court has already rejected Defendants' argument that ION's Accused Products do not "predict"; thus, as to claim 15 of the '607 patent, Defendants' motion must be denied.

C. Claim 15 of the '967 Patent

Claim 15 of the '967 patent requires that the patented device include "a global control system transmitting location information to at least one local control system on the [sic] at least one streamer positioning device having a wing, the local control system adjusting the wing." ('967 patent at claim 16.) The Court construed "location information" to mean "information regarding location." (Doc. No. 120 at 22.) ION argues that location information necessarily includes information regarding both depth and horizontal location, and that its lateral controller does not infringe because it does not transmit such information.

Defendants quote the following language from the '967 patent in support of their construction of the claim language:

The global control system **22** can transmit location information to the local control system **36** instead of force information. Instead of the desired vertical force **44**, the global control system **22** can transmit a desired vertical depth and the local control system **36** can calculate the magnitude and direction of the deviation between the desired depth and the actual depth. Similarly, instead of transmitting a desired horizontal force **42**, the global control system **22** can transmit the magnitude and direction of the displacement between the actual horizontal position and the desired horizontal position of the bird **18**.

('967 patent at col. 6, ll. 45-56.) Defendants emphasize the specification's reference to "vertical depth" and "horizontal position," and urge that, because this is the only discussion of "location information" in the '967 patent's specification, location information must include information regarding both depth and horizontal position.

Plaintiff responds that neither this Court's claim construction nor the plain language of the specification requires the transmission of *both* depth and horizontal location. The Court agrees that, from reading the claim language quoted above, it is not self evident that both depth and horizontal information must be transmitted. More

importantly, the evidence submitted by Plaintiff indicates that ION's lateral controller does send location information, or information that is substantially the same as "location information."

ION employee Mr. Macnab has testified that "ORCA provides the positions of the nodes on all the streamers and the separation of those nodes to the nearest streamer adjacent to them." (Macnab Dep. at 140:17-19.) That information regarding the location of the nodes—including the DigiFINs—is then used by the lateral controller to control the DigiFINs. (*Id.* at 140:23-141:6.) As summarized in the User's Manual for ION's lateral controller, the DigiFIN angle "is adjusted by the shipboard Lateral Controller Software to control the lateral movement of the streamer at the location of the device." (Doc. No. 291-21 at ION15133.) Most persuasively, when asked whether "ORCA sends location information to the lateral controller," and whether "the lateral controller manipulates that location information and sends it on to the DigiFINs in order to achieve desired steering or desired separation," Mr. Macnab answered "Yes." (Macnab Dep. at 141:18-23.)

Mr. Macnab's testimony describes a global control system transmitting location information to at least one local control system on at least one streamer positioning device having a wing, with the local control system adjusting the wing. The Court finds Mr. Macnab's confirmation that "location information" is used in this way to be sufficient to raise a genuine issue of material fact. However, the Court notes that Plaintiff's expert, Dr. Triantafyllou, also confirms that the desired wing angle transmitted from the lateral controller to the DigiFIN devices is "insubstantially different" from the recited "location information." (Triantafyllou Opening Report ¶ 115.) The evidence

indicates that ION's accused projects may infringe, if not literally, then under the doctrine of equivalents. Accordingly, summary judgment as to the '967 patent must be denied.

D. Claim 18 of the '520 Patent

The parties have filed cross-motions regarding infringement of the '520 patent. Defendants move for summary judgment that they have not infringed the '520 patent, and Plaintiff moves for summary judgment of willful infringement. Claim 18 of the '520 patent requires "(a) an array of streamers each having a plurality of streamer positioning devices there along [sic]; [and] (b) a control system configured to use a control mode selected from a feather angle mode, a turn control mode, a streamer separation mode, and two or more of these modes." ('520 patent at claim 18.) The parties dispute the meaning of the latter requirement; thus, before the Court can make a ruling on infringement, it must construe the claim language.

1. Claim construction

Defendants contend that, pursuant to this limitation, the control system must be configured to use all four of the recited modes; that is, it must be configured to select from (1) a feather angle mode, (2) a turn control mode, (3) a streamer separation mode, and (4) two or more of these modes. Utilizing this construction, Defendants urge that their products do not infringe, as they do not practice a "turn control mode." In contrast, Plaintiff reads the "selected from" language in claim 18 to introduce a list of alternatives. Under Plaintiff's reading, ION's product would need to utilize only one of the four alternatives in order to infringe.

In urging their interpretation of claim 18, Defendants compare claim 18 to claim 1, which requires “a control system configured to operate *in one or more control modes* selected from a feather angle mode, a turn control mode, and a streamer separation mode.” (‘520 patent at claim 1 (emphasis added).) Defendants acknowledge that the language in claim 1 “makes clear that the control system need only be configured to operate in one control mode.” (Doc. No. 298 at 9.) However, they suggest that because the “in one or more control modes” language is absent from claim 18, claim 18 requires something different from claim 1—it requires the control system to be configured to operate in all of the listed control modes.

Defendants are correct that, “[w]hen different words or phrases are used in separate claims, a difference in meaning is presumed.” *Nystrom v. TREX Co., Inc.*, 424 F.3d 1136, 1143 (Fed. Cir. 2005) (citing *Tandon Corp. v. United States Int’l Trade Comm’n*, 831 F.2d 1017, 1023 (Fed. Cir. 1987)). However, “[d]ifferent terms or phrases in separate claims may be construed to cover the same subject matter where the written description and prosecution history indicate that such a reading of the terms or phrases is proper.” *Id.* (citing *Tandon*, 831 F.2d at 1023-24). Here, the slightly different wording of the two claims, when read in the context of the specification and in light of general principles of claim construction, does not indicate that a difference in meaning was intended.

First, it is important to note the context in which the ‘520 patent’s 34 claims are provided. The claims are divided into 17 method claims and 17 apparatus claims. Each method claim has a corresponding apparatus claim. Claim 1 is the method claim that corresponds to the apparatus in claim 18; in examining these parallel claims, it seems

clear that the drafters intended them to require the same thing, that is, that the control system could be configured to operate in at least one of the enumerated modes.

More importantly, this interpretation of the claim language is supported by established principles of claim construction. The Federal Circuit has made clear that the use of the indefinite article “a”, as used in claim 18 (“a control system configured to use *a* control mode selected from”), denotes “one or more.” See *Crystal Semiconductor Corp. v. TriTech Microelectronics Int’l, Inc.*, 246 F.3d 1336, 1347 (Fed. Cir. 2001) (citing cases). Although *Crystal* and the cases cited therein consider the meaning of “a” when it is followed by open-ended transitional phrases, such as “comprising,” the Court finds the same interpretation applicable to this claim. Because the Court reads “a” to mean “one or more,” the Court reads claim 18 to mean “a control system configured to use one or more control modes, selected from” the list of four. As such, claim 18 is construed to include the same language that, when used in claim 1, convinced Defendants that the control system needed to be configured to operate in only one control mode. The Court’s interpretation of the indefinite article “a”, combined with Defendants’ interpretation of claim 1, persuades the Court that only one of the four options must be practiced in order for infringement to lie.

Finally, the use of the phrase “selected from” further supports this construction. “Selected from” denotes one of several styles known in patent practice as “*Markush* groups,” although the precise label is unimportant. A *Markush* group typically is expressed in the form: “a member selected from the group consisting of A, B, and C.” *Abbott Labs. v. Baxter Pharm. Prods., Inc.*, 334 F.3d 1274, 1280 (Fed. Cir. 2003). Where such a form is expressed, courts are to read the members of the *Markush* group as

alternatives, and the infringement of one is sufficient to infringe the claim. *Id.* at 1283.

The claim at issue in this case does not use all of the typical *Markush* language: though it includes the phrase “selected from,” it does not include the typical “consisting of” language. The Federal Circuit has, at times, held that a proper *Markush* group, recited in the conventional manner, should use the phrase “consisting of.” *Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1372 (Fed. Cir. 2005). However, the Manual of Patent Examining Procedure explains that:

When materials recited in a claim are so related as to constitute a proper Markush group, they may be recited in the conventional manner, or alternatively. For example, if “wherein R is a material selected from the group consisting of A, B, C and D” is a proper limitation, then “wherein R is A, B, C or D” shall also be considered proper.

MPEP § 2173.05(h) (8th ed. July 2010). The Manual further indicates that “[a]lternative expressions are permitted if they present no uncertainty or ambiguity with respect to the question of scope or clarity of the claims.” *Id.* The label “*Markush*” is, therefore, unimportant.¹² What matters is that there is a clear list of alternatives, any one of which will bring an accused system within the scope of the claim. Thus, contrary to Defendants’ contention, the list recited here does not indicate that an infringing system must be able to perform all four listed modes; instead, any one of those alternative choices will bring

¹² In any event, the Federal Circuit has, in some cases, referred to groups containing the “selected from” language as *Markush* groups, notwithstanding the absence of the “consisting of” language. For example, the Federal Circuit referred to the following language as presenting a *Markush* group: “Wherein R⁴ is a residue of a nucleophilic compound *selected from* hydroxyl, mercapto, cyano, azido, amino, carbamoyloxy, carbamoylthio and thiocarbamoyloxy.” *Pharmacia & Upjohn Co. v. Ranbaxy Pharmaceuticals, Inc.*, 85 F. App’x 205, 209 (Fed. Cir. 2003) (emphasis added). Similarly, in *Metcalf v. Hampel*, 532 F.2d 1360, 1362 (C.C.P.A. 1976), the claim language at issue, “selected from spirit soluble azo dyes and finely divided pigmenting material,” was interpreted as setting forth a *Markush* group. A leading patent law treatise provides this straightforward interpretation: “A ‘Markush’ claim recites a list of alternatively useable species.” 4 Pat. L. Fundamentals § 15:20 (2d ed. 2012).

about infringement of the claim, assuming that the other elements of the claim are present.¹³ The Court finds Plaintiff's construction of claim 18 to be correct.¹⁴

2. Infringement under Section 271(a)

A patent claim is directly infringed under Section 271(a) if, without authority, a person “makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefore.” 35 U.S.C. § 271(a). Defendants do not dispute that ION's control system is configured to use a “streamer separation mode” as construed by the Court. (Garris Rebuttal Report, Doc. No. 276-57 at 20-24; Brune Rebuttal Report, Doc. No. 276-58 ¶ 12 (“The Lateral Control Software . . . focuses on streamer separation for the dominant part of its control function.”).) As described in ION's Lateral Controller User's Manual, DigiFIN is designed to operate in control modes including “Even Separation” and “Fan Separation.” (Doc. No. 291-21-2 at ION01542.) The even separation mode “attempt[s] to keep even separation between all of the streamers.” (*Id.*) Dr. Triantafyllou opines that Defendants' control system is also capable of selecting two or more modes to implement at the same time, such as a feather angle mode and a streamer separation mode. (Triantafyllou Expert Report ¶ 94 (“This aspect of ORCA and the Lateral

¹³ Defendants' proposed construction must fail for another reason: it would strike the words “a control mode selected from” out of the claim, requiring instead “a control system configured to use [] a feather angle mode, a turn control mode, a streamer separation mode, and two or more of these modes.” Constructions that would “render the disputed claim language mere surplusage” must be rejected. *Texas Instruments, Inc. v. U.S. Int'l Trade Comm'n*, 988 F.2d 1165, 1171 (Fed. Cir. 1993); *Superseed Software, Inc. v. Oracle Corp.*, 447 F. Supp. 2d 672, 682 (S.D. Tex. 2006).

¹⁴ Defendants urge that, if claim 18 is construed as having a *Markush* group, it is invalid based on prior art. The Court interprets Defendants to argue that any construction of claim 18 which does not require an infringing product to be configured to use all of the listed modes renders claim 18 invalid based on prior art. The Court has now so construed the claim. For that reason, in taking up Defendants' invalidity contentions, above, the Court considered whether claim 18 is invalid based on prior art.

Controller allows a user to operate modes that achieve both feather angle mode and streamer separation mode.”.) Under the Court’s construction, only one of these two modes would be necessary to infringe claim 18.

ION’s technical expert, Mr. Brune, similarly testified that ION’s Accused Products are capable of operating two modes at the same time: when asked whether “[y]ou could set a feather angle for the ghost streamer in Orca and specify that all of the other streamers are at the even separation based off that ghost streamer,” Mr. Brune responded that this was possible. (Brune Dep. at 178:1-5.) He then confirmed that such a mode “would be a combination of setting—or attempting to set the feather angle for the ghost streamer with having an even separation with all the other streamers.” (*Id.* at 178:20-24.) Again, although multiple modes are unnecessary under the Court’s claim construction, Mr. Brune’s report confirms that ION’s Accused Products can, at a minimum, operate in the infringing streamer separation mode. In light of this evidence, Defendants’ Motion for Summary Judgment as to claim 18 of the ‘520 patent must be denied. The question of whether ION’s accused products infringe this claim under Section 271(a) must be answered by the jury.

3. Infringement under Sections 271(f)(1) and (f)(2)

1. The parties’ positions on 271(f)(1)

Section 271(f)(1) of the Title 35 of the United States Code provides as follows:

Whoever without authority supplies or causes to be supplied in or from the United States all or a substantial portion of the components of a patented invention, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer.

35 U.S.C. § 271(f)(1). The components of a patented invention are the patented invention's constituent parts, elements, and ingredients. *See Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 576 F.3d 1348, 1362-63 (Fed. Cir. 2009) (*en banc*). Plaintiff moves for summary judgment that Defendants infringe claim 18 of the '520 patent under Section 271(f)(1). Defendants respond that they do not infringe claim 18 of the '520 patent under Section 271(f)(1) because they do not supply or cause to be supplied in or from the United States "all or a substantial portion of" the components of claim 18. As to the Fugro Defendants, Defendants further argue that foreign purchasers are not liable under Section 271(f), that Fugro does not supply or cause to be supplied components of the patented invention from the United States, and that Fugro does not supply any of the components in such a manner as to actively induce the combination to form the patented invention.

a. ION's liability: supplying or causing to be supplied all or a substantial portion of the components of claim 18

It is undisputed that ION manufactures every DigiFIN and associated lateral controller in the United States. (*See* ION's Resp. to Req. for Admis., Doc. No. 276-21 at No. 32; Doc. No. 308-98 at Nos. 47, 49, 50.) It is also apparent that ION supplies its DigiFINs and lateral controllers to its customers in or from the United States. (Doc. No. 276-21 at Nos. 33, 34; Doc. No. 276-14 at No. 51; Doc. No. 276-62 at ION892450-454; Doc. No. 276-63 at ION8914750475-477; Doc. No. 276-64 at ION892690, 892742-752.) At issue is whether the DigiFINs and lateral controllers manufactured and supplied from the United States are a substantial portion of the patented invention, sufficient to give rise

to liability under Section 271(f)(1). Plaintiff contends that they are, and points to the testimony of Mr. Macnab. Mr. Macnab has explained that, in all four of the modes recited in claim 18, the lateral controller is essentially doing “all of the control system functionality.” (Macnab Dep. at 88:19-89:6, 151:1-5, 231:10-13.) John Thompson, ION’s marketing specialist, testified that, without the DigiFIN, ION’s customers would not be able to laterally steer the streamers. (Thompson Dep. at 242:22-243:8.) Mr. Thompson affirmed that, “[o]f the components ION provides to its customers allowing or assisting customers to achieve better repeatability of streamer positions over times,” the DigiFIN devices is a “substantial component.” (*Id.*) Neither ION’s nor Fugro’s experts appear to dispute that all of the requirements of § 271(f)(1) are satisfied. (Garris Rebuttal Report; Brune Rebuttal Report.)

Defendants respond that DigiFINs and lateral controllers are not a substantial portion of the patented invention. As Defendants note, claim 18 requires streamers, streamer positioning devices, *and* a control system. ION emphasizes that, because the towing of streamers with a plurality of streamer positioning devices attached therealong is decades-old (Lambert Decl., Doc. No. 298-D ¶ 6), the only “new” component added to the combination is the control system. Defendants contend that they do not supply ORCA or any other control system from the United States. (*Id.* ¶ 3.) Defendants argue that, without ORCA (or a similar navigation system), ION’s towed streamer system cannot operate in any of the modes upon which Plaintiff argues ION’s system infringes. Thus, Defendants posit, absent the supply of ORCA, a reasonable jury could conclude that ION does not supply all or a substantial portion of the components of claim 18 from the United States.

Plaintiff does not appear to dispute that Defendants do not sell ORCA from the United States. Instead, Plaintiff notes that ION employees, engineers, and even its CEO have testified that ORCA is not required to use DigiFIN. (Gentle Dep., Doc. No. 308-87 at 50:8-11; Lambert Dep., Doc. No. 308-102 at 164:6-10; Flynn Dep., Doc. No. 308-89 at 132:13-22.) And, as discussed above, Mr. Macnab has confirmed that the lateral controller and DigiFIN do “all the work” to infringe the control modes recited in the claim. Neither the lateral controllers nor the DigiFINs therefore can be regarded as insignificant or insubstantial components of the claimed combination. In light of this evidence, Defendants’ motion of non-infringement, as to ION, must be denied.

b. Fugro’s liability: foreign purchaser liability under Section 271(f)

Defendants urge that, even if the DigiFIN and lateral controller comprise a substantial portion of the components of claim 18, Fugro cannot be held liable under Section 271(f) for a number of reasons. First, Defendants contend that foreign purchasers cannot be held liable under Section 271(f). In support of this position, Defendants offer portions of the legislative history of Section 271(f) that indicate that the principal aim of the amendment was “[t]o declare it to be patent infringement to supply components of an invention patented in the United States for final assembly abroad if the purpose of the shipment abroad is to circumvent a U.S. patent.” (Doc. No. 298-J, Report of the Senate Judiciary Committee on S. 1535, 98-663, at *1.) Defendants opine that the act of buying a component of an invention was not intended to be an act of infringement. Defendants cite only one case in which a court has held that Section 271(f) is limited to actors present

in the United States. *Synaptic Pharm. Corp. v. MDS Panlabs, Inc.*, 265 F. Supp. 2d 452, 464 (D.N.J. 2002).

Neither Fugro's location abroad nor its role as a purchaser automatically absolves it of liability under Section 271(f)(1). As to location, the Federal Circuit has emphasized that "[t]he plain language of § 271(f)(1) focuses on the location of the accused components, not the accused infringer." *Pellegrini v. Analog Devices, Inc.*, 375 F.3d 1113, 1117-18 (Fed. Cir. 2004). And, as at least one court has recognized, "the legislative history [of § 271(f)(1)] suggests the phrase, 'actively induce' was intended to broaden the basis for liability, extending it to cover both those who actually supply the components as well as those (contributory infringers) who cause others to supply components." *T.D. Williamson, Inc. v. Laymon*, 723 F. Supp. 587, 592 (N.D. Okla. 1989), *aff'd*, 923 F.2d 871 (Fed. Cir. 1990). Moreover, the one case on which Defendants rely, *Synaptic*, 265 F. Supp. 2d at 464, is not directly on point. *Synaptic* addressed only method claims, and the court in that case was not presented with the question here—whether or not a foreign entity can supply or cause to be supplied *components* from the United States. 265 F. Supp. 2d at 464. Thus, that Fugro is a foreign purchaser is not dispositive; the Court instead must consider whether the Fugro Defendants supply or cause to be supplied in or from the United States all or a substantial portion of the components of claim 18 of the '520 patent.

c. Fugro's liability: whether the Fugro Defendants supply or cause to be supplied components of the invention from the United States

Fugro contends that, even if it *can* be held liable under Section 271(f)(1) notwithstanding its role as a foreign purchaser, it is not liable in this case because it does

not actually supply or cause to be supplied components of claim 18 of the '520 patent. WesternGeco offers evidence demonstrating that Fugro both supplies *and* causes to be supplied components of claim 18 from the United States. Fugro's role in "supplying" such components involves its use of an agent in the United States to receive those components in the United States, and then ship them abroad. Specifically, WesternGeco cites the testimony of Svetlana Baraniuk, who states that Fugro uses the freight forwarder "Kuehne and Nagel" to ship devices, including DigiFINS, from the United States. (Baraniuk Dep., Doc. No. 276-23 at 21:20–24, 23:1–9, 25:16–23, 27:10–14.)

WesternGeco offers evidence that demonstrates that, after the initiation of this lawsuit, Fugro changed its policies from supplying these components through its own agent, to instead causing the components to be supplied directly from ION. According to the expert report of Michael J. Wagner, Fugro's damages expert, Fugro developed a practice, after the initiation of this lawsuit, of having ION supply DigiFIN from the United States directly to Fugro vessels around the world. (Wagner Rebuttal Report Doc. No. 276-26, at 23 ("Based on a schedule of DigiFIN purchases prepared by Fugro, all deliveries of DigiFINS since December 2009 have occurred outside of the United States. This schedule shows that delivery and legal title has been taken in South Africa, The Netherlands, Norway, and Australia.").) The testimony of Paul Winspear confirms that Fugro requests units of DigiFIN from ION, and asks for those units to be supplied to different locations around the world. (Winspear Dep., Doc. No. 276-25 at 234:17-25.) WesternGeco contends that, by using Kuehne and Nagel to ship DigiFINS outside of the country, and by requesting that ION ship DigiFINS from the United States to outside of

the United States on Fugro's behalf, Fugro has both supplied and caused to be supplied components of claim 18 from the United States.

Defendants respond that Ms. Baraniuk's testimony regarding Fugro's use of Kuehne and Nagel does not show that Fugro actually received DigiFINs in the United States. However, Defendants fail to respond to Ms. Baraniuk's testimony that Kuehne and Nagel acted as Fugro's "agent," storing Fugro's equipment and arranging shipment for Fugro. (Baraniuk Dep. at 20:5-8.) Defendants offer no meaningful legal difference between Fugro shipping DigiFINs itself, and it paying an agent to do so on its behalf. *Cf. Crowell v. Baker Oil Tools*, 143 F.2d 1003, 1004 (9th Cir. 1944) ("It is obvious that one may infringe a patent if he employ an agent for that purpose of have the offending articles manufactured for him by an independent contractor."). However, even if Defendants' argument were accepted—that is, even if Fugro's use of Kuehne and Nagel could not render it a supplier of components—it would nonetheless indisputably be *causing* the supply of these items abroad. Plaintiff's uncontroverted evidence unquestionably shows that Fugro did cause DigiFINs to be supplied outside of the country, if it did not supply the components itself.

d. Fugro's liability: whether the Fugro Defendants supply or cause to be supplied "*components*"

Section 271(f)(1) only applies where multiple components of an invention have been supplied in or from the United States. *See Ormco Corp. v. Align Tech., Inc.*, 609 F. Supp. 2d 1057, 1073-74 (C.D. Cal. 2009) (citing cases); *see also Bristol-Myers Squibb Co. v. Rhone-Poulenc Rorer, Inc.*, No. 95 CIV 8833, 2001 WL 1263299, at *12 (S.D.N.Y. Oct. 19, 2001), *aff'd*, 326 F.3d 1226 (Fed. Cir. 2003). "One cannot actively

induce the combination of ‘such components’ outside the United States where there is only one ‘such’ component supplied in or from the United States.” *Bristol-Myers Squibb Co.*, 2001 WL 1263299, at *4. Defendants contend that, because Plaintiff focuses only on Fugro’s role in supplying or causing to be supplied the DigiFIN, a single component, Plaintiff has not shown that Fugro has supplied or caused to be supplied multiple components.

Defendants are incorrect in their interpretation of Plaintiff’s motion. Plaintiff specifies, in a footnote, that its use of the word “DigiFIN” throughout the motion refers to “both the DigiFIN units on the towed streamers as well as the shipboard Lateral Controller.” (Doc. No. 276 at 4 n.2.) Thus, contrary to Defendants’ suggestion, Plaintiff has alleged potential acts of infringement involving the supply of both DigiFINs and lateral controllers. Plaintiff produces evidence that demonstrates Fugro’s supply of a lateral controller and a number of DigiFIN units from the United States in July 2010; the place of dispatch is listed as the location Fugro’s agent, Kuehne and Nagel, in Houston. (Doc. No. 308-96 at FGRPROD5021815-17.) Plaintiff has also produced a packing slip report showing a shipment from ION, in the United States, to Fugro, outside of the United States; the packing slip lists “software DigiFIN lateral controller” as one of the items ordered. (Doc. No. 308-97 at ION892939.) Though Plaintiff’s evidence is minimal, it is uncontroverted, and it shows that Fugro did supply, or cause to be supplied, DigiFINs and lateral controllers from the United States. As the Court concluded above, these two components comprise a substantial portion of the components of claim 18 of the ‘520 patent.

e. Fugro’s liability: whether the Fugro Defendants supply or cause to be supplied components *in such a manner as to actively induce the combination to form the patented invention*

Fugro argues that, even if it supplies or causes to be supplied components of claim 18 from the United States, it does not do so in such a manner as to actively induce the combination to form the patented invention, i.e., a system with streamers, positioning devices, and a control mode with one of claim 18’s listed control modes. The Fugro Defendants’ argument is imprecise, as they fail to specify why their supply or cause of the supply of components is not done in such a manner as to actively induce the combination. Adding to the opacity of this issue, WesternGeco fails to address it altogether in its motion (Doc. No. 276). Indeed, the only evidence supporting the notion that Fugro supplies or causes to be supplied components *in such a manner as to actively induce the combination* is offered in conjunction with WesternGeco’s Section 271(f)(2) arguments, and WesternGeco’s arguments as to willfulness. WesternGeco does not address Defendants’ argument at all in its Reply. (Doc. No. 308.)

The Court interprets WesternGeco’s position to be that, because DigiFIN operates in the patented “streamer separation mode” by default, and because Fugro uses that patented mode in every, or nearly every, survey it conducts, Fugro’s supply or cause of the supply of DigiFINs and lateral controllers actively induces the combination of the components recited in claim 18. (Lateral Controller User’s Manual, Doc. No. 276-11 at ION015142 (“The operational mode will be set to *Even Separation* mode by default.”); *id.* at ION015156 (The operational mode “allows you to change the operational mode of the Lateral Controller between Even Separation and FAN Separation. The Even

Separation option is used to maintain target separation between streamers throughout the spread.”); Project Procedure Navigation, Doc. No. 276-29 at FGRPROD000109764 (“Deployment reflects a DigiFin spread for maintaining even streamer separation and will be the most common spread deployed.”); Project Procedure Navigation, Doc. No. 276-30 at FGRPROD001284833 (listing “even separation 3D” as one of the “standard operational modes” for DigiFIN).)

The Court agrees that the manner in which Fugro supplies or causes to be supplied the DigiFIN and the lateral controller makes it highly likely that the two components will be combined to infringe claim 18 of the ‘520 patent. Fugro has offered no evidence, aside from a single 2D survey, to suggest that it used these materials in any non-infringing way. The evidence submitted by WesternGeco makes clear that Fugro’s role in supplying or causing to be supplied these components was done in such a manner as to encourage the use of the two together to infringe claim 18 of the ‘520 patent. Fugro’s own “Project Procedure Navigation” documents, in particular, demonstrate that Fugro used DigiFINs to accomplish the infringing streamer separation mode.¹⁵ What is not clear is whether both ION and Fugro’s supply/cause of the supply of components in such a manner as to encourage their combination—which ultimately infringed on WesternGeco’s patent—is sufficient to meet the mental state requirement of Section

¹⁵ To the extent that the Fugro Defendants mean to argue that they cannot actively induce their *own* infringement, at least two courts have rejected such an argument, and this Court likewise rejects it. *See Moore U.S.A. Inc. v. Standard Register*, 144 F. Supp. 2d 188, 195 (W.D.N.Y. 2001) (rejecting the defendant’s argument that it could not “induce” itself to infringe a patent); *T.D. Williamson, Inc. v. Laymon*, 723 F. Supp. 587, 592 (N.D. Okla. 1989) *aff’d*, 923 F.2d 871 (Fed. Cir. 1990) (holding that the active inducement of a third party is not necessary under Section 271(f)(1)).

271(f)(1), if such a requirement exists. The Court requests supplemental briefing addressing this question, below.

2. The parties' arguments on 271(f)(2)

Section 271(f)(2) of Title 25 of the United States Code provides as follows:

Whoever without authority supplies or causes to be supplied in or from the United States any component of a patented invention that is especially made or especially adapted for use in the invention and not a staple article or commodity of commerce suitable for substantial noninfringing use, where such component is uncombined in whole or in part, knowing that such component is so made or adapted and intending that such component will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer.

35 U.S.C. § 271(f)(2). WesternGeco moves for summary judgment of infringement under Section 271(f)(2).

WesternGeco reemphasizes the fact that the DigiFIN and lateral controller are manufactured and supplied from the United States, and that these components are specifically designed to be used for steering modes. As indicated by ION's Lateral Controller User's Manual, DigiFIN operates in its Even Separation Mode (the patented "streamer separation mode") by default. (Doc. No. 276-11 at ION015142, ION015156.) As noted above, Fugro's Project Procedure Navigation, a document which "sets out how to start, execute, and end a marine seismic acquisition project," states that "[d]eployment reflects a DigiFin spread for maintaining even streamer separation and will be the most common spread deployed." (Doc. No. 276-29 at FGRPROD000109764.) These documents make clear that DigiFIN and the lateral controllers are designed and used with steering modes, including the infringing even separation mode.

Defendants respond that Plaintiff's motion must be denied because Defendants have shown a substantial non-infringing use of the components at issue. Defendants emphasize that summary judgment of infringement under Section 271(f)(2) must be denied if there is any evidence that: (1) the components at issue could be used in a way so as to not infringe the combination of claim 18; and (2) the components were actually used in that other, non-infringing way. *See Ormco Corp. v. Align Tech., Inc.*, 609 F. Supp. 2d 1057, 1075 (C.D. Cal. 2009) (“[I]n order to take advantage of the ‘substantial noninfringing use’ exception, an alleged infringer must show both that ‘the device at issue, in theory, could be used in a way so as not to infringe the asserted method claim’ and ‘that the device was actually used in the non-infringing way.’” (quoting *Golden Blount, Inc. v. Robert H. Peterson Co.*, 438 F.3d 1354, 1363 (Fed. Cir. 2006))). Of course, under the plain language of the statute, the actual non-infringing use of the component(s) must be “substantial.” 35 U.S.C. § 271(f)(2). “A ‘substantial’ use of an accused feature is one that is not occasional, farfetched, impractical, experimental, or hypothetical.” *ClearValue, Inc. v. Pearl River Polymers, Inc.*, 735 F. Supp. 2d 560, 575 (E.D. Tex. 2010), *aff’d in part, rev’d in part*, 668 F.3d 1340 (Fed. Cir. 2012); *see also Hoffmann–La Roche, Inc. v. Promega Corp.*, 33 U.S.P.Q. 2d 1641, 1648 (N.D. Cal. 1994) (“Whether a use is ‘substantial’ or not depends on how likely and often the use will occur. Thus, occasional aberrant use of a product does not make that use ‘substantial.’ Similarly, inefficient and uneconomical uses are less likely to be deemed ‘substantial.’”).

The only evidence supporting Defendants’ argument that there was a substantial, non-infringing use of the components at issue consists of expert testimony as to the components’ potential to be used in a non-infringing manner, as well as evidence

indicating that Fugro actually may have used the devices in a non-infringing manner in a single survey. Fugro's expert, Dr. Garriss, offers a conclusory statement that "the DigiFIN and Lateral Controller could easily be used on a single streamer to conduct a 2D survey." (Garriss Rebuttal Report at 55.) Though he hypothesizes that these components *could* be used in such a way, Dr. Garriss does not point to any two-dimensional surveys by Fugro, nor does he offer any evidence that such hypothetical uses might be *substantial*. The only record evidence that Fugro ever operated such a non-infringing two-dimensional survey is deposition testimony by Fugro employee Roar Lunde that indicates that Fugro conducted one such survey in 2010. (Lunde Dep. at 103:8–16.) Mr. Lunde testified that Fugro no longer has 2D vessels. (*Id.* at 104:22–105:6.) Thus, though evidence exists as to the potential non-infringing use of 2D surveys (Dr. Garriss' Report), and even possibly the non-infringing use through such surveys (Lunde's Deposition), no evidence demonstrates *substantial* non-infringing use through 2D surveys.

Similarly, ION's expert, Mr. Brune, opines that "DigiFINs *could* be used on the tail end of streamers during deployment from a vessel, for the purpose of avoiding entanglement of tail buoys" without the use of an automated control system. (Brune Rebuttal Report at 12 (emphasis added).) Mr. Brune does not explain why this would be a non-infringing use, and Defendants offer no evidence to demonstrate that the components were *actually* used in this way, much less that such use was substantial. No record evidence exists that DigiFINs have ever been used for this purpose.

Ultimately, none of Defendants' evidence demonstrates a substantial, non-infringing use of the components at issue, and Plaintiff's evidence of infringing use persuades the Court that no such substantial non-infringing use existed. However,

because the parties have not addressed the question of mental state under Section 271(f)(2), and because the question appears to be one of first impression, the Court declines to resolve the pending motion without further briefing from the parties on the mental state requirement.

3. Mental state requirement under Section 271(f)

In addressing Defendants' liability under Section 271(f), neither Plaintiff nor Defendants addresses the requisite mental state that a defendant must have to "actively induce" under Section 271(f)(1), or to "know," under Section 271(f)(2), "that the combination for which his component was especially designed was both patented and infringing." 35 U.S.C. § 271(f)(1).

The Federal Circuit has recognized that "[t]he language of section 271(f) itself mimics the language of the indirect infringement provisions of Sections 271(b) and (c)." *Zoltek Corp. v. United States*, 672 F.3d 1309, 1334 (Fed. Cir. 2012). Section 271(f)(1) uses the phrase "actively induce," as used in Section 271(b). Section 271(f)(2) uses the language "knowing that such component is so made or adapted and intending that such component will be combined," which is similar to Section 271(c)'s "knowing the same to be especially made or especially adapted for use in an infringement of such patent." The question is whether these statutes are so analogous—271(f)(1) to 271(b) and 271(f)(2) to 271(c)—that the same mental state is required under both.

The United States Supreme Court has ruled upon the mental state requirements of both Sections 271(b) and (c). In considering the requisite mental state for liability under Section 271(c), the Supreme Court held, in a badly fractured decision, that knowledge of a patent is needed to infringe under Section 271(c). *Aro Mfg. Co. v. Convertible Top*

Replacement Co., 377 U.S. 476, 488 (1964) (“[A] majority of the Court is of the view that [§] 271(c) does require a showing that the alleged contributory infringer knew that the combination for which his component was especially designed was both patented and infringing.”). It was not until 2011 that the Supreme Court had occasion to consider whether the same knowledge is needed for induced infringement under Section 271(b). Explaining that Sections 271(b) and (c) “have a common origin in the pre-1952 understanding of contributory infringement,” and that “the language of the two provisions creates the same difficult interpretive choice,” the Supreme Court concluded that it would be “strange to hold that knowledge of the relevant patent is needed under § 271(c) but not under § 271(b).” *Global-Tech Appliances, Inc. v. SEB S.A.*, 131 S. Ct. 2060, 2068 (2011). Accordingly, the Supreme Court held that “induced infringement under § 271(b) requires knowledge that the induced acts constitute patent infringement.” *See also Merial Ltd. v. Cipla Ltd.*, No. 2011-1471, 2012 WL 1948879 (Fed. Cir. May 31, 2012) (noting that, after *Global-Tech*, “[t]o support a finding of inducement under § 271(b), the accused infringer must have knowingly and intentionally induced another party’s direct infringement”).

No court has yet spoken definitively on whether the mental state requirements of Sections 271(b) and (c), as interpreted by the Supreme Court, apply to Sections 271(f)(1) and (f)(2). Indeed, *Williamson*, which was affirmed by the Federal Circuit, explicitly rejected an interpretation of “active inducement” that would have required active inducement of a third party. 723 F. Supp. at 591-92. However, the *Williamson* court, writing before the Supreme Court’s opinion in *Global-Tech*, did not explicitly consider what, if any, mental state is required for infringement under Section 271(f)(1).

The Court ultimately must decide whether the supply of components “in such a manner as to actively induce the combination of such components . . . in a manner that would infringe the patent” if it occurred in the United States, Section 271(f)(1), requires the same mental state as the active inducement of infringement, Section 271(b). The same comparison and analysis is required as between Section 271(f)(2) and Section 271(c). The Court therefore asks the parties to submit supplemental briefing indicating: (1) whether Sections 271(f)(1) and (f)(2) have mental state requirements; and (2) if so, whether those requirements should be drawn from the mental state requirements in the analogous language of Sections 271(b) and (c). The parties are asked to include, in their supplemental briefing, a discussion of why their proposed interpretations are advisable as a policy matter.¹⁶

4. Willfulness

WesternGeco also moves for summary judgment on willfulness, arguing that Defendants willfully infringed the ‘520 patent. “[T]o establish willful infringement, a patentee must show by clear and convincing evidence that the infringer acted despite an objectively high likelihood that its actions constituted infringement of a valid patent.” *In re Seagate*, 497 F.3d 1360, 1371 (Fed. Cir. 2007). “The state of mind of the accused infringer is not relevant to this objective inquiry.” *Id.* Once this “threshold objective standard is satisfied, the patentee must also demonstrate that this objectively-defined risk (determined by the record developed in the infringement proceeding) was either known

¹⁶ That is, if Plaintiff urges that Section 271(f)(1) should be read as requiring only active inducement of the *combination*, and not of the infringement, Plaintiff is instructed to explain why Section 271(f)(1) should, as a policy matter, require a different mental state than 271(b). Conversely, if Defendants urge that Sections 271(b) and 271(f)(1) should be read to require the same mental state, they are instructed to indicate why such a reading makes sense from a policy standpoint.

or so obvious that it should have been known to the accused infringer.” *Id.* The questions before this Court therefore are (1) whether there was an objectively high likelihood that Defendants’ activities infringed claim 18; and (2) if so, whether Defendants knew or should have known of this objective risk of infringement.

“Under the objective prong, the answer to whether an accused infringer’s reliance on a particular issue or defense is reasonable is a question for the court when the resolution of that particular issue or defense is a matter of law.” *Powell v. Home Depot U.S.A.*, 663 F.3d 1221, 1236 (Fed. Cir. 2011). Reliance on a reasonable defense to a charge of infringement negates a finding of objective recklessness. *See Powell*, 663 F.3d at 1236. The determination of whether the accused infringer’s reliance on a defense was objectively reckless is a question of fact. *Id.* The Federal Circuit has explained that, “[a]lthough the question of objective recklessness will be decided by the Court when the resolution of that particular defense is a question of law (*e.g.*, a claim construction defense), the question of objective recklessness remains one of fact, not law, to be decided at trial.” *See id.* at 1236-37; *see also Seagate*, 497 F.3d at 1371 (requiring the objectively-defined risk of patent infringement to be “determined by the record developed in the infringement proceeding”). “Under this objective standard, both legitimate defenses to infringement claims and credible invalidity arguments demonstrate the lack of an objectively high likelihood that a party took actions constituting infringement of a valid patent.” *Black & Decker, Inc. v. Robert Bosch Tool Corp.*, 260 F. App’x 284, 291 (Fed. Cir. 2008).

In light of the evidence presented, the Court concludes that the “objective standard” must be determined at trial. Plaintiff’s motion for summary judgment as to the

validity of the ‘520 patent was denied, and Defendants have raised colorable arguments as to the potential invalidity of that patent, as discussed above. It is up to a jury to determine whether Defendants’ invalidity arguments—which persuaded the Court to deny Plaintiff’s motion as to validity—are credible, and whether they demonstrate that Defendants did not act despite an objectively high likelihood that their actions constituted infringement of a valid patent.

IV. NON-INFRINGEMENT OF ZAJAC SYSTEM CLAIMS

Defendants move for summary judgment of non-infringement on the system claims of WesternGeco’s ‘038 patent. As discussed above, the determination of whether an accused product infringes a patent claim involves two steps: (1) a court must construe the claim terms, as a matter of law, to determine their proper scope; and (2) the claim, as properly construed, must be compared to the accused device. *Markman*, 52 F.3d at 976. On July 16, 2010, the Court performed the first step of the infringement analysis, issuing its initial claim construction of the patents-in-suit. (Doc. No. 120.) The construed terms relevant to this motion are as follows:

CLAIM TERM	COURT’S CONSTRUCTION
“active streamer positioning device (ASPD)”	“a device capable of controlling the vertical and horizontal position of the seismic streamer” (Doc. No. 120 at 34)
“master controller”	“a controller that sends commands to other devices in a system” (<i>Id.</i> at 35)
“the master controller”	“a master controller” (<i>Id.</i> at 35)
“positioning commands”	“signals or instructions to control positioning” (<i>Id.</i> at 35)
“maintaining a specified array geometry”	“maintaining a specified array shape” (<i>Id.</i> at 35)

Defendants argue that they have not infringed the Zajac Patent’s system claims under 35 U.S.C. §§ 271(a), (b), or (c) because they have not made, used, offered for sale, or sold in

the United States an accused system. They also assert that they have not infringed the ‘038 patent’s system claims under 35 U.S.C. §§ 271(a), (b), (c), or (f), because ION’s accused product does not infringe literally or under the doctrine of equivalents.

A. Infringement under 35 U.S.C. §§ 271(a), (b), and (c)

1. Infringement under Section 271(a)

A patent grants to the patentee “the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States.” 35 U.S.C. § 154(a)(1). Therefore, a patent is only directly infringed under Section 271(a) if, without authority, the patented invention is made, used, offered for sale, or sold within the United States during the term of the patent. 35 U.S.C. § 271(a); *see Joy Techs.*, 6 F.3d at 773. The Patent Act of 1952 defines United States as “the United States of America, its territories and possessions.” 35 U.S.C. § 100(c). In two prior Orders, this Court has held that the high seas, including the Chukchi Sea and the United States’ Exclusive Economic Zone (“EEZ”), including the EEZ in the Gulf of Mexico, are not U.S. territories or possessions for purposes of the Patent Act. (Doc. No. 164, at 19-20; Doc. No. 144, at 37, 41). A claim for direct patent infringement under Section 271(a) requires, as an element of the claim, proof that the infringing activity took place in the United States. *See Litecubes, LLC v. N. Light Prods., Inc.*, 523 F.3d 1353, 1366 (Fed. Cir. 2008). Defendants contend that they did not directly infringe WesternGeco’s ‘038 patent because they did not make, use, offer for sale, or sell the claimed systems in the United States.

1. Makes or uses

Defendants each assert that they do not “make” or “use” the claimed invention in the United States because they “ha[ve] not towed an array of streamers with a DigiFIN attached to one of the seismic streamers in the United States.” (Doc. No. 269 at 13). In considering where a claimed system is “made,” courts look to the place the system is assembled for operable use—in other words, the place where the alleged infringer combines all of the claim elements. *See Rotec Indus., Inc. v. Mitsubishi Corp.*, 215 F.3d 1246, 1252 (Fed. Cir. 2000) (citing *Deepsouth Packing Co. v. Laitram Corp.*, 406 U.S. 518, 524 (1972)); *Centillion Data Sys., LLC v. Quest Commc’n Int’l Inc.*, 631 F.3d 1279, 1288 (Fed. Cir. 2011). Manufacturing only the parts of a claimed system without combining all of the claim elements is not the “making” of a claimed system. *Centillion*, 631 F.3d at 1288. Similarly, a claimed system is “used” under Section 271(a) at the place the system as a whole is put into service. *Id.* at 1284 (“[T]o ‘use’ a system for purposes of infringement, a party must put the invention into service, *i.e.*, control the system as a whole and obtain benefit from it.”); *NTP*, 418 F.3d at 1317 (“The use of a claimed system under section 271(a) is the place at which the system as a whole is put into service, *i.e.*, the place where control of the system is exercised and beneficial use of the system obtained.” (citation omitted)). Merely supplying the elements of a claimed system is not the “use” of the system. *Centillion*, 631 F.3d at 1286.

Defendants contend that the ‘038 patent’s claimed systems are not “made”—that is, they are not assembled for operable use—until a towing vessel for towing a seismic array has (1) in tow, an array comprising a plurality of seismic streamers with an “active streamer positioning device” attached to at least one of the streamers; and (2) in place, a “master controller” able to issue positioning commands to each ASPD. (‘038 patent at

claims 1, 14, 19, 20, 25.) Defendants contend that the claimed systems are not “used”—that is, they are not put into service—until a towing vessel actually tows an array of streamers with an ASPD attached to at least one streamer and a master controller issuing positioning commands to each ASPD. This Court has construed ASPD to mean “a device capable of controlling the vertical and horizontal position of the seismic streamer.” (Doc. No. 120 at 34.)

Defendants urge that, even assuming DigiFIN includes a device capable of controlling the vertical and horizontal position of the seismic streamer,¹⁷ neither Defendant has towed an array of streamers with a DigiFIN attached within the United States, in any United States waterway, or in the United States’ territorial sea.¹⁸ As to ION, Defendants offer testimony by DigiFIN’s inventor, an engineer at ION, that all of ION’s testing of its DigiFIN device on an array of towed streamers was completed 12 miles seaward of the baseline of the coastal state, rendering any “making” or “use” of the system outside of the United States. (Olivier Decl., Doc. No. 269-G ¶ 5.) As to Fugro, Defendants offer testimony from a Fugro employee that Fugro has not towed an array of streamers with a DigiFIN attached to one of the seismic streamers in the United States, in any United States waterway, or in the United States’ territorial sea. (Vaage Decl., Doc. No. 269-P ¶ 3.)

In an effort to counter this evidence, WesternGeco points to the testimony of Fugro witnesses who have stated that they performed surveys using the accused DigiFIN

¹⁷ Defendants’ argument that the DigiFIN does not include such a device is considered below.

¹⁸ The United States’ territorial sea is the belt of sea that extends no more than 12 miles seaward of the baseline of the coastal state. *See* Proclamation No. 5928, 54 Fed. Reg. 777 (Dec. 27, 1988) (extending the territorial sea of the United States to 12 nautical miles from the baselines of the United States).

devices in U.S. waters (Lunde Dep., Doc. No. 286-23 at 124:8-19), and that U.S. ports were used in many surveys involving vessels using the accused products (*id.* at 113:21-25; Stiver Dep., Doc. No. 286-50 at 167:19-168:18; Vaage Dep., Doc. No. 286-17 at 196:15-17; Baraniuk Dep., Doc. No. 286-51 at 113:4-14; Christensen Dep., Doc. No. 286-52 at 29:14-17). In a prior Memorandum and Order (Doc. No. 300), the Court rejected much of this evidence as immaterial to the question of whether allegedly infringing activity took place in the United States. Again here, the witness who discusses the use of the DigiFIN in “American waters” clearly refers to a survey conducted in the Chukchi Sea. (Lunde Dep. at 124:8-19.)

The evidence about Fugro docking in American ports is similarly unhelpful. For example, WesternGeco submits the testimony of Roar Lunde, a Fugro employee, who testifies that, at the time Fugro was running a survey in the Gulf of Mexico, Fugro was operating out of a port in Tampa, Florida. (*Id.* at 113:18-25.) Fugro employee Kevin Stiver testifies that it would have been “typical” to use a U.S. port for mobilization/demobilization for a survey conducted in the Gulf of Mexico, and that it would have been typical to use a U.S. port for crew changes for such a survey. (Stiver Dep. at 190-11-18.) Ms. Baraniuk testifies that the GEO Celtic ship stopped at a port in Alaska, but that she did not know whether the GEO Celtic went into the port, or whether the equipment going into the port included DigiFINs. (Baraniuk Dep., Doc. No. 286-51 at 113:4-14.) The testimony of Helen Elizabeth Bjerke Christensen, a Fugro employee who has expressed her belief that a Fugro vessel has come into port in the United States, is unpersuasive. (Christensen Dep., Doc. No. 286-52 at 29:14-17). Even if all of the above testimony—most of which includes qualifiers indicating that the witnesses were not sure

that U.S. ports were even used—were accepted as true, the fact that Fugro may have docked at U.S. ports does not evidence the “making” or “using” of infringing products in the United States.

Finally, as to ION, WesternGeco offers evidence that ION assisted in surveys on Fugro vessels and performed its own activities “shore side” in New Orleans. (Doc. No. 286-53 at ION804766-67 (“Extensive shore side testing on the DigiFIN device has been completed.”).) However, such “shore-side testing” of the DigiFIN is not evidence that the *patented system* was made or used in the United States. In fact, the cited document discussing shore-side testing also indicates that, “[t]o complete the analysis of this problem we need to deploy our test equipment *on a vessel* under conditions similar to those that produced the data we have received.” (*Id.* (emphasis added).) This evidence persuades that the Court shore-side tests to which WesternGeco refers were not conducted on a vessel, and therefore lacked a required element of the ‘038 patent (a towing vessel). (‘038 patent at claim 1.)

WesternGeco also emphasizes the fact that ION conducts testing on Fugro vessels while streamers are deployed and equipped with DigiFIN and DigiBIRD. (Doc. Nos. 286-54 at ION015697-727, 286-55 at ION629654-66.) WesternGeco notes that these tests can be conducted while the vessel is in transit to the survey area (Doc. No. 286-56 at ION817943), urging the Court to draw the inference that, because testing *can be* conducted before the vessel reaches the survey area, and because the vessel may be in the United States for some period of time before it reaches the survey area, testing might be conducted in the United States. This unsupported inference is insufficient to raise a genuine issue of material fact in light of ION’s testimony that all of its testing of DigiFIN

devices on an array of towed streamers “was conducted at least 13 nautical miles from the coastline of the United States and its territories.” (Olivier Decl. ¶ 5.)

Ultimately, in attempting to counter Defendants’ evidence that they did not make or sell infringing products in the United States, all WesternGeco offers is evidence of the Defendants’ surveys outside of the United States, evidence of their use of United States ports, and an unsupported inference that the Defendants may have conducted tests in the United States while they were in transit to the survey locations. WesternGeco offers no evidence that the patented system was assembled for operable use or actually used in the United States. *See Centillion*, 631 F.3d at 1286-88. The limited evidence put forward by WesternGeco does not give rise to a genuine issue of material fact, and the Court concludes that neither the Fugro Defendants nor ION made or used the patented system in the United States.

2. Offers to sell or sells

Each of WesternGeco’s claimed systems includes, as a limitation, “a towing vessel for towing a seismic array.” (’038 patent at claims 1, 14, 19, 20, 25.) Therefore, in order to infringe these claims of the ’038 patent under the offers to sell or sells prong, ION must offer to sell or sell a towing vessel for towing a seismic array. 35 U.S.C. § 271(a); *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Contractors USA, Inc.*, 617 F.3d 1296, 1310-11 (Fed. Cir. 2010). If what was sold or offered was something other than the “patented invention,” that sale or offer is not actionable. *Id.* at 1309 (“The offer must be for a potentially infringing article.”); *FieldTurf Int’l, Inc. v. Sprinturf, Inc.*, 433 F.3d 1366, 1370 (Fed. Cir. 2006). Likewise non-infringing is the sale of, or the offer to sell, “less than a complete invention.” *See Rotec Indus.*, 215 F.3d at 1252 & 1252 n.2.

ION's Vice President of Engineering for the Marine Imaging Systems Division states that "ION does not provide (or offer to sell) its customers the vessel necessary to conduct a marine seismic survey. Specifically, ION does not make, offer to sell, or sell towing vessels." (Lambert Decl., Doc. No. 269-F. ¶ 5.) Instead, ION offers to sell and sells only the equipment and software necessary to perform marine seismic surveys. (*Id.* at ¶¶ 4-5; *see also* Doc. No. 269-K (listing products offered by ION).) In fact, ION does not have the manufacturing capability to produce vessels capable of towing a seismic array, nor does ION own a vessel designed or equipped to tow the seismic arrays. (Lambert Decl. ¶ 5.) ION's customers, therefore, cannot purchase, rent, or lease a vessel capable of towing a seismic array from ION. (*Id.*) This uncontroverted evidence indicates that ION has not offered to sell or sold WesternGeco's entire patented invention as claimed in the '038 patent. Absent proof that ION offered to sell or sold the entire patented invention, ION cannot be liable for direct infringement under the offers to sell or sells prongs of Section 271(a). *See BMC Res., Inc. v. Paymentech, L.P.*, 498 F.3d 1373, 1380 (Fed. Cir. 2007) (requiring that a party make, use, sell, or offer to sell the entire patented invention for actionable infringement); *Rotec Indus.*, 215 F.3d at 1252 (specifying that a selling or offering to sell less than the operable assembly of the whole patented invention is not an act of infringement under Section 271(a)).

The Fugro Defendants offer evidence that they have not contracted or offered to perform any surveys using lateral streamer steering in any United States waterway or in the United States' territorial sea. (Vaage Decl. ¶ 4.) In light of this uncontroverted evidence, the Court concludes that the Fugro Defendants have not offered to sell or sold

WesternGeco's entire patented invention of claims 1, 14, 19, 20, and 25 of the Zajac patent.

WesternGeco does not appear to dispute that neither ION nor Fugro sold or offered for sale vessels capable of towing a seismic array. Instead, WesternGeco contends that Defendants "sell services involving all of the patented components, including the vessel, mean[ing] that they sell and offer to sell the entire patented invention." (Doc. No. 286 at 28.) WesternGeco cites no law in support of the proposition that Defendants can infringe on system claims by selling services involving the patented components. Indeed, this position directly contradicts the case law requiring that a sale, or offer to sell, be for the "patented invention" itself. *Transocean*, 617 F.3d at 1310-11. If what was sold or offered was something other than the "patented invention," that sale or offer is not actionable. *Id.* at 1309 ("The offer must be for a potentially infringing article.") The patented inventions at issue in Defendants' motion claim systems, not services. The sale of services is not the sale of the patented systems. Ultimately, Defendants' sale and offers to sell less than the complete patented system entitles them to summary judgment under the sells and offers to sell prong. In light of the foregoing, the Court concludes that no genuine issue of material fact exists as to Defendants' infringement of the Zajac system claims under 35 U.S.C. § 271(a).

2. Infringement under Sections 271(b) and (c)

"Liability for either active inducement of infringement or for contributory infringement is dependent upon the existence of direct infringement." *Joy Techs.*, 6 F.3d at 774. Thus, absent proof of direct infringement, any claim for indirect infringement under Sections 271(b) or (c) also must fail. *See Deepsouth*, 406 U.S. at 526; *Epcon Gas*

Sys., Inc. v. Bauer Compressors, Inc., 279 F.3d 1022, 1033 (Fed. Cir. 2002). Because the Court found that no genuine issue of material fact existed as to either Defendant's infringement in the United States, the Court concludes that there can be no liability under Sections 271(b) or (c).

B. Infringement under 35 U.S.C. §§ 271 (a), (b), (c), and (f)

Defendants contend that ION's towed streamer system does not infringe the '038 patent's system claims either literally or under the doctrine of equivalents. Although the Court has already determined that Defendants did not infringe under Section 271 (a), (b), and (c), Section 271(f) is still at issue. The Court's above conclusions do not affect Defendants' liability under Section 271(f)(1), as it explicitly covers the provision of less than an entire invention. Thus, the Court considers Defendants' further arguments that neither ION nor Fugro infringes under Section 271(f), because ION's system does not comprise an ASPD or an "array geometry tracking system."

1. ASPD

The Zajac patent's system claims require an ASPD attached to at least one streamer in an array of seismic streamers. ('038 patent at claims 1, 14, 19, 20, 25.) The Court has construed an ASPD to mean "a device capable of controlling the vertical and horizontal position of the seismic streamer." (Doc. No. 120 at 46.) Defendants urge that ION's towed streamer system does not comprise a device capable of controlling the vertical *and* horizontal position of a seismic streamer. Specifically, Defendants assert that the DigiFIN can control only lateral (horizontal), and not vertical, position. Plaintiff responds that the DigiFIN's "Backoff Control Algorithm" is capable of controlling vertical position.

The Lateral Controller User's Manual for the DigiFIN indicates that, when the DigiFIN's roll or pitch exceeds the specified threshold value, the DigiFIN's main processor function applies a "Backoff Control Algorithm" to adjust the wing angle, which has as a consequence a reduction in the amount of vertical force being exerted by the device. (Doc. No. 269-L at ION835138.) According to ION's expert and ION employee Daniel Seale, when DigiFIN is in the "Normal + Depth Aware" mode, the Backoff Control Algorithm attempts to minimize any depth error by taking into account the depth error, fin angle, and roll orientation. (Seale Decl., Doc. No. 269-I ¶ 12; Brune Decl. ¶¶ 19-20.) The Lateral Controller User's Manual indicates that the DigiFIN's Backoff Control Algorithm "should be enabled when precise depth control is important." (Doc. No. 286-21 at ION015158.) A Fugro engineer has indicated that the "Normal + Depth Aware" mode for the DigiFIN "will consider the actual depth of the unit versus the target depth when the roll or pitch boundary is violated and then decide to back-off or not." (Doc. No. 287-25 at FGRPROD000036333). In responding to a question about whether ION does anything to try to control DigiFIN's effect on depth for streamers, Jeffery Cunkelman, ION's Vice President of Product Marketing, testified that "there is a function that monitors the vertical orientation, and if that vertical orientation exceeds a limit, it will back down the wing angle to eliminate any of those forces that may cause a depth variation." (Cunkelman Dep., Doc. No. 269-E at 157:3-11.)

Defendants emphasize that the back-off algorithm cannot be commanded by a user to drive a streamer to a given depth and, therefore, is not intended to control the streamer's depth, but to correct DigiFIN's errors. (*See, e.g.*, Brune Decl. ¶ 19; Seale Decl. ¶ 12.) The importance of this testimony is unclear, as the ability of a user to drive a

streamer to a given depth is not a part of the Court's construction. Defendants also maintain that the incidental effect the back-off algorithm has on the depth of the streamer "cannot plausibly be considered 'depth control.'" (Doc. No. 269 at 21.) They rely on the expert declaration of Mr. Brune, who states that the DigiFIN's exertion of vertical forces on the streamer is not considered "depth control" in practice. (Brune Decl., Doc. No. 269-H ¶ 19.) Again, Defendants' focus on the term "depth control" is misguided, as the Court did not construe ASPDs to require "depth control."

Under the Court's construction, an ASPD need only be capable of controlling horizontal and vertical position. To meet this requirement, the DigiFIN must have the ability to control the vertical position of the streamer, even if it is not "specifically designed or sold to [do so]." See *Revolution Eyewear, Inc. v. Aspex Eyewear, Inc.*, 563 F.3d 1358, 1370 (Fed. Cir. 2009). Defendants admit that the back-off algorithm "has as a consequence a reduction in the amount of vertical force being exerted by the device"; in other words, the algorithm causes a reduction in the amount of vertical force exerted by the DigiFIN, resulting in a change in vertical positioning. (Doc. No. 269 at 21.) The Court is persuaded, in light of the foregoing evidence, that the DigiFIN includes an ASPD capable of controlling the vertical and horizontal position of a seismic streamer.

2. Array geometry tracking system

Claims 3 and 4 require the system to include an "array geometry tracking system for tracking the array geometry versus time during a seismic data acquisition run and storing the array geometry versus time in a legacy database for repeating the array geometry versus time in a subsequent data acquisition run." ('038 patent at claim 3.) Claim 14 requires the system to include the following:

[A]n array geometry tracking system for tracking the array geometry versus time during a seismic data acquisition run, wherein the master controller compares the vertical and horizontal positions of the streamers versus time and the array geometry versus time to desired streamer positions and array geometry versus time and issues positioning commands to the ASPDs to maintain the desired streamer positions and array geometry versus time.

(*Id.* at claim 14.) The Court has construed “array geometry” to mean “array shape.” (Doc. No. 120 at 35.) Accordingly, claims 3 and 4 require the system to store array shape versus time in a legacy database for repeating the array shape, and claim 14 requires that the master controller compare the array shape to the desired array shape and issue positioning commands to the ASPDs to maintain the array shape versus time.

Defendants contend that ION’s towed streamer system does not utilize an array shape to plan subsequent data acquisition runs. According to Defendants’ expert, Mr. Brune, ION’s products instead use “single feather angles to represent simple straight line approximations of the streamer shapes from prior data acquisition runs.” (Brune Decl. ¶ 23.) Mr. Macnab similarly avers that ORCA “does not consider the actual shape of the array from a prior data acquisition run to plan a subsequent run,” and instead “considers a single feather angle for each streamer.” (Macnab Decl., Doc. No. 269–J ¶ 10.)

WesternGeco argues that a feather angle value from a prior survey *is* a shape, and that, under the Court’s construction, there are no further qualifiers as to how specific or exact this shape must be. Indeed, Mr. Macnab has previously admitted that the Accused Products load information “that represents the shape of the—the shape of the entire streamer” in repeating 4-D surveys. (Macnab Dep., Doc. No. 286-43 at 62:23-63:14.) Defendants’ limited evidence on this point does not convince the Court that no genuine issue of material fact exists. In light of the earlier testimony by Mr. Macnab, the Court

thinks that there is a genuine factual dispute as to whether ION's towed streamer system utilizes an array shape to plan subsequent surveys. Thus, as to Section 271(f), Defendants' motion must be denied.

CONCLUSION

I. INVALIDITY

In light of the foregoing, the Court concludes that Defendants' Motion for Summary Judgment of Patent Invalidity of the Bittleston Patents (Doc. No. 273) must be **DENIED**. Defendants' Motion for Summary Judgment of Patent Invalidity of the Zajac Patent (Doc. No. 270) likewise must be **DENIED**. To the extent that Plaintiff moves for summary judgment of validity, Plaintiff's Motion for Summary Judgment of Willful Infringement of Valid Claim of the '520 Patent (Doc. No. 276) must be **DENIED**.

II. INFRINGEMENT

The Court concludes that Defendants' Motion for Summary Judgment of Non-Infringement of the Bittleston Patents' Apparatus Claims (Doc. No. 272) must be **DENIED**. Plaintiff's Motion for Summary Judgment of Willful Infringement of the '520 Patent (Doc. No. 276) must be **DENIED IN PART**. Plaintiff's motion is **DENIED** as to willfulness. The Court reserves judgment as to Defendants' infringement under Sections 271(f)(1) and (f)(2), on which it requests supplemental briefing. Both parties' supplemental briefing must be submitted no later than June 22, 2012.

Defendants' Motion for Summary Judgment of Non-Infringement of the '038 Patent's Systems Claims (Doc. No. 269) must be **GRANTED IN PART** and **DENIED IN PART**. Defendants' motion is **GRANTED** as to Plaintiff's claims of infringement

under 35 U.S.C. §§ 271(a), (b), and (c). It is **DENIED** as to Plaintiff's claims under 35 U.S.C. § 271(f).

IT IS SO ORDERED.

SIGNED at Houston, Texas, on this the 26th day of June, 2012.

A handwritten signature in black ink, appearing to read "Keith P. Ellison", written over a horizontal line.

KEITH P. ELLISON
UNITED STATES DISTRICT JUDGE